

IRON AGE

OCTOBER 18, 1951

VOL. 168, NO. 16

THE IRON AGE
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DIGEST

of the week in metalworking

STEEL LEADS RADIANT HEAT MARKET RACE

PAGE 53 Steel pipe makers have drawn ahead in the radiant heating market race. More steel is being used for this type of heating than any other material. But copper and wrought iron are still being used in many jobs and hot competition will continue. Dark horse in the race is flexible steel tubing.

HOW TO LOSE ZINC AND LEAD IMPORTS

PAGE 54 Although Washington has added another 2¢ to restricted prices of zinc and lead it has set a record of blundering which will cut vital imports of the two metals. The import ceiling is several cents below the previously established one and domestic industry sees metal supplies diverted.

CMP CUTS TO LOWER FARM MACHINE OUTPUT

PAGE 55 International Harvester's pessimistic report on fourth quarter materials situation brought a chorus of "omens" from other producers. CMP cutbacks will drop output 15 to 20 pct below the third quarter. A further loss of 30,000 tons of steel in the first quarter '52 will make matters worse.

SAFEGUARD BUYERS ON REBUILT MACHINES

PAGE 56 Manufacturers seeking to equip their plants for war production with rebuilt machine tools will now have a guarantee of quality and performance. This is provided in a new OPS order (CPR 80) which also stabilizes used machine tool prices. The rebuilding "code" may lead to new standards.

ISSUE FIRST QUARTER TICKETS FOR CMP

PAGE 60 DPA has authorized first quarter 1952 CMP tickets for 20,880,000 tons of steel, with an additional 2,334,000 tons reserved for emergencies and self-certified MRO orders. This is 112 pct of an estimated supply of 21,125,000 tons. Allocations of copper and aluminum also topped supply.

PINPOINT FLAWS OF WASHINGTON PLANNING

PAGE 71 Butt of a needling campaign by Washington officials, the steel and metalworking industry turned to fight with a report that outlined flaws in production planning and suggested remedial methods. Top mobilization officials are beginning to see the light that cooperation works both ways.

WEST COAST STEEL PLANTS KEEP GROWING

PAGE 83 Slow deliveries of equipment fail to upset building schedules for new facilities. New rolling mills are nearing completion. Hopes for Nevada blast furnace grow as iron ore exports to Japan continue. Foreign pig goes beginning as local stocks rise. Ore cargo ships have been bought.

LOW GRADE ORES YIELD FERROCHROME

PAGE 95 In addition to permitting much closer control of the chromium content without chilling the steel bath exothermic ferrochromium utilizes low grade chromium ores. Chrom-X is used in the ladle only. Carb-X, another exothermic ferrochromium, may be used in certain cast iron applications.

YOU CAN CUT PLATING STREAM POLLUTION

PAGE 99 Good housekeeping and close control of plating room processes can cut waste and save money for metal finishers, while aiding in abatement of stream pollution. A study shows that much valuable plating material which is now wasted in streams, can actually be salvaged and reused.

RADIALLY-FED GEAR SHAVER DEVELOPED

PAGE 102 General Motors has modified two Michigan gear shavers for straight radial feed. Neither the cutter nor the work reciprocates. Cutter breakage is reduced, so tool cost is lower though the special tool is originally more expensive. Production is almost double that of unmodified shavers.

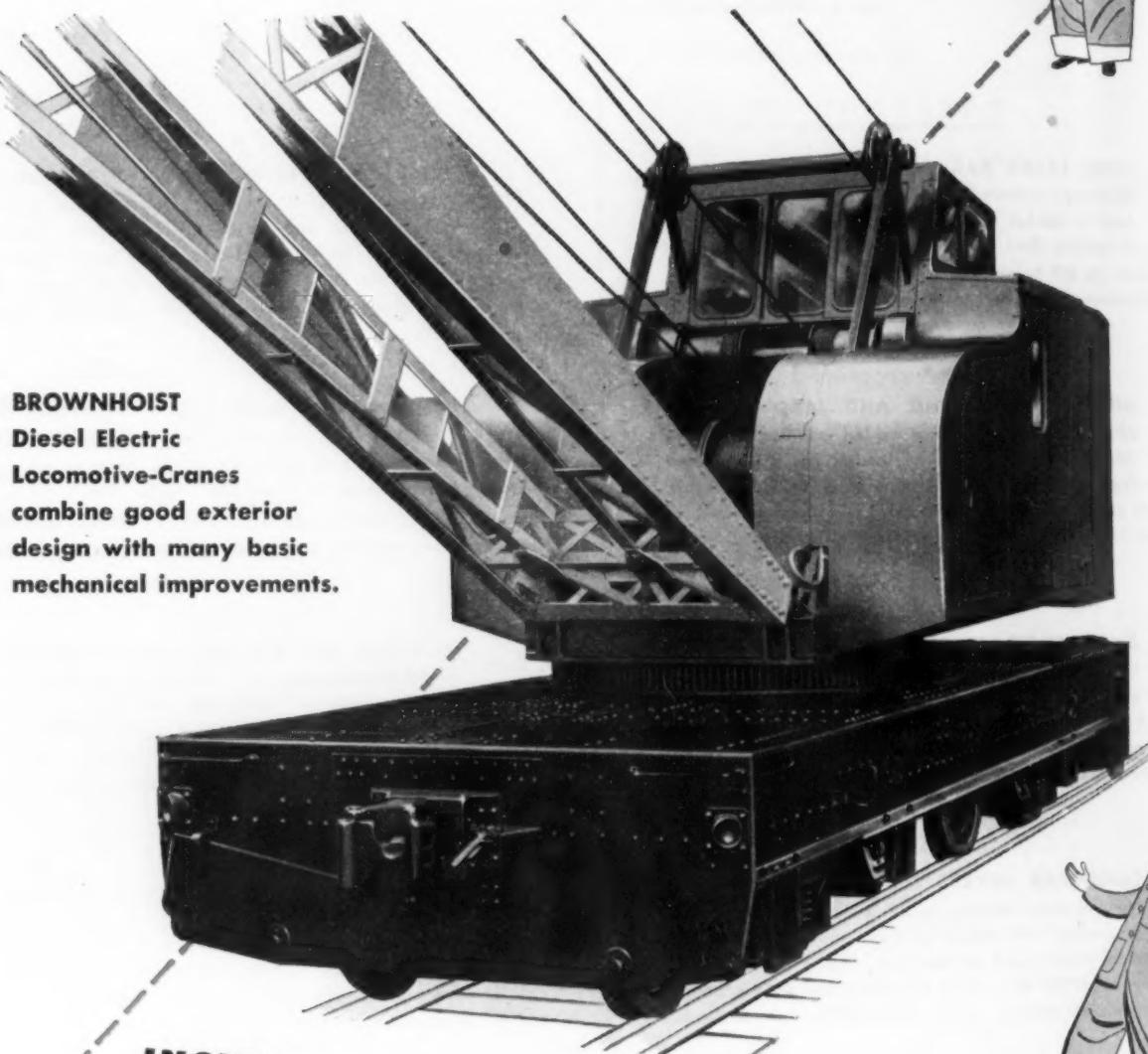
APPLAUD STEELMAKERS' CMP SUGGESTIONS

PAGE 137 Control-weary manufacturers were quick to applaud steel leaders' suggestions on how to improve CMP last week. A question often repeated was "What are they (Washington officials) going to do about it? Manufacturers are wary. Most feel steel's advice will help smooth out CMP wrinkles.

ASSEMBLY INSPECTION WITH 22-MEV X-RAYS

NEXT WEEK The 22-million volt betatron, little brother of big atom smashers, produces X-rays which can look through thick steel and inspect assembled mechanisms. Besides the ability to inspect thicker sections, the 22-mev X-rays have other advantages over those produced by filament machines.

OUTSIDE: It's a beauty Extra-heavy Streamlined MONITOR-TYPE CAB! 360° visibility! All controls conveniently located; all machinery fully protected from the weather, yet accessible. New CLEAR VISION BOOM. 14 inch safety clearance between car body and upper works.



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combine good exterior
design with many basic
mechanical improvements.

INSIDE: It's really engineered New DYNAMATIC CLUTCH gives smooth, sensitive 32-step control, banishes slippage, eliminates torsional impulse and vibration. Safe FRICTION CLUTCH BOOM HOIST driven by worm and wheel in oil bath. Twin-barrelled, extra-large boom-hoist drums take all line in one layer. New Wide-faced Hoist Drums mounted on roller bearings with air cylinder mounted within the drum. ELECTRIC ROTATION and electric travel reduce maintenance to a minimum. Optional features include 8-WHEEL CHAIN DRIVE for increased drawbar pull and TWIN ENGINE DRIVE where greater tractive effort is required.



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Don't Handicap Yourself

LAST week was "Employ the Physically Handicapped Week." Everywhere employers were asked to give these people a chance to help the defense effort, to strengthen their own pride and confidence and to become a part of everyday democracy. Now is the time to check your reaction to this drive.

The gestures to make this plan successful are of the highest order. Handicapped people—able to work—are safe workers, and are valuable to management. Those who have employed handicapped people—and there are many—know this well.

There is a sadness about this "once a year" stuff. It is necessary to have such a "week" to bring home the value of handicapped and older workers. But it is also a sad commentary on our common sense and human honesty.

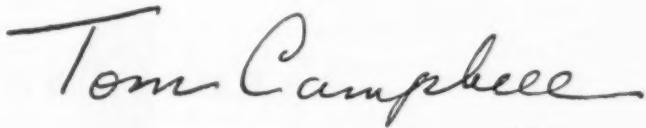
A man who has physical handicaps is no different, as a worker, than one without handicaps—if he is able to do a good job. Some employers either do not know this or they retain a stupid squeamishness which is indefensible.

There are personnel managers who "think" the policy of the company is to go lightly on hiring handicapped and older people. They should not take that slant unless they have checked the latest top level policy of their company. By the same token top management should not let others believe that a no-hiring policy exists when it doesn't.

In thousands of plants handicapped workers are finding work that remakes their life. They have become a part of the whole picture. They support themselves. They forget self pity and worries and take their place along side of everyone else. They become an important part of their family, their company and their country.

There is much groundwork yet to be done with management. There are still silly prejudices to be killed but big gains have been made.

Let's not make hiring handicapped people a subject to be reviewed once a year—let's take it in our stride every day in the year.


Tom Campbell

Editor

3 reports

On the new Steam Homo method for bluing

1 Solves cadmium shortage

The cadmium shortage caught a New England plant with its inventory down. At the suggestion of an L&N field engineer, they used a Steam Homo already in their heat-treat to blue some sample parts. Now, 80% of the parts that were previously cadmium plated on one of their products are blued. When cadmium is again available, they intend to stick with Steam Homo bluing. Close fitting parts operate smoother . . . costs are lower . . . and, they never have to worry about a steam shortage. Another Steam Homo is on order.



2 Eliminates hazards

A large manufacturer of tools didn't like the smell and hazards of the bluing method being used on die stocks and tap wrenches. After a demonstration, the firm switched to the Steam Homo Method. Now, operating people are happy . . . working conditions greatly improved. So many other uses for this versatile furnace have been found that now there are seven Steam Homos . . . with four more on order.

3 Better corrosion resistance



A large midwestern manufacturer tested several methods of bluing stators and rotors of electric motors. Parts were blued, and then placed in a humidity cabinet at 100% humidity and 110 F until red rust appeared. Steam Homo blued parts were still in good shape after three months. The other parts had rusted in less than half this time. Now that the Steam Homo Method is an integral part of their production set-up, their inspectors claim that color uniformity and general appearance are the best they've ever seen.

THESE are typical examples of the results plants all over the country are getting with the new Steam Homo Method for bluing. Durable, uniform, corrosion resistant and eye appealing, this type of finish can be applied to any iron or steel product.

Because steam is used as the furnace atmos-

sphere, the process is clean, non-hazardous and inexpensive . . . the Steam Homo can be installed directly in production lines.

To find out what the Steam Homo Method can do for your product, get in touch with the nearest L&N office or write to 4956 Stenton Ave., Philadelphia 44, Pa.

LEEDS  NORTHRUP

Jrl Ad T-620(34)

Dear Editor:

Letters from readers

The Good Word

Sir:

I have read your editorial "The Good Word" in the Sept. 6 issue of your magazine. This is a fine editorial. It doesn't cost anything to compliment or commend people with a good word but gives them a tremendous lift.

Your editorial is a dandy.

E. P. STAHL

The Garlock Packing Co.
Palmyra, N. Y.

Offers Solution

Sir:

Your Aug. 30 issue carried a letter from Mr. Troy of Eastern Metal Products Co. urging the United States to assist Canadian aluminum expansion and to limit domestic producers. The government did that in the last war, making long-term firm contracts with the Canadian producer. Here is what happened:

(1) About 75 pct of the aluminum was delivered after the shortage ended.

(2) The United States paid about 30 pct above the domestic price and received nothing comparable to the huge tax rebates paid by United States producers.

(3) Power and aluminum capacity were built in Quebec. Had they been built here, current shortages would be much less acute.

(4) A severe cancellation penalty in the Canadian contract caused the government to accept metal long after United States production had outdistanced demand. To limit the surplus, United States plants were shut down and eventually demolished.

(5) None of the United States financed capacity in Canada is available for military or stockpile needs today. Despite a 20 pct increase in Canadian output, shipments of primary aluminum to this country have dropped 20 pct in the first half of 1951 as against the 1950 period.

Aside from the unfortunate circumstances of previous long-term contracts with the Canadian producer, such an arrangement is unsound for these basic reasons:

(1) Substantial quantities of Canadian aluminum would come from Kitimat, on the Pacific Coast, only 1600 miles from Russian bomber bases and also open to naval attack. Greatly lengthened ocean supply lines would also be more vulnerable.

(2) This capacity would not come in until 1954, while new United States plants will be producing by early 1952.

(3) Privately financed United States expansion now under way totals 80 pct of pre-Korea capacity and over eight times 1939 capacity—with the price 2¢ lower than in 1939. This competition has resulted in the creation of thousands of independent fabricators.

(4) Canadian fabricating facilities would expand, taking markets away from domestic fabricators. This trend is shown by doubled foil imports from Canada this year as compared to the same period last year, despite the 20 pct drop in ingot imports.

We cannot import solutions to our domestic problems. Today's aluminum shortage is entirely due to the double burden of maintaining high civilian economy and simultaneously producing arms for the free world. Aluminum production has risen more sharply than any other metal. The producers were not only willing but took the leadership in creating more capacity as needed.

No one is to blame for the shortage, unless it is Joe Stalin and his cohorts. Surely those who have done the most to create more aluminum here cannot be at fault. The problem is not to find a scapegoat but rather to end the shortage. That is exactly what the United States producers are doing.

I. LIPKOWITZ
Asst. to President
Reynolds Metals Co.
New York

Induction Hardening

Sir:

We have noted with very considerable interest the item on the Newsfront page of your Sept. 20 issue describing the increasing use of induction hardening for parts and for heating forgings in the automobile industry.

We would appreciate learning the source of your information. Any statistics or other data would also be very helpful and of real value to us.

R. C. WAYNE
Surface Combustion Corp.
Toledo

We had in mind, particularly, the extensive use of induction hardening (and gas flame hardening) used in a new engine. Our source has told us that the number of applications is much higher than that of any other automobile producer. Quite a number of inquiries are being received for the use of induction hardening on defense parts too. There is also a spectacular application in the use of induction hardening on a new tank which is reported to be one of the most ambitious jobs ever attempted.

—Ed.

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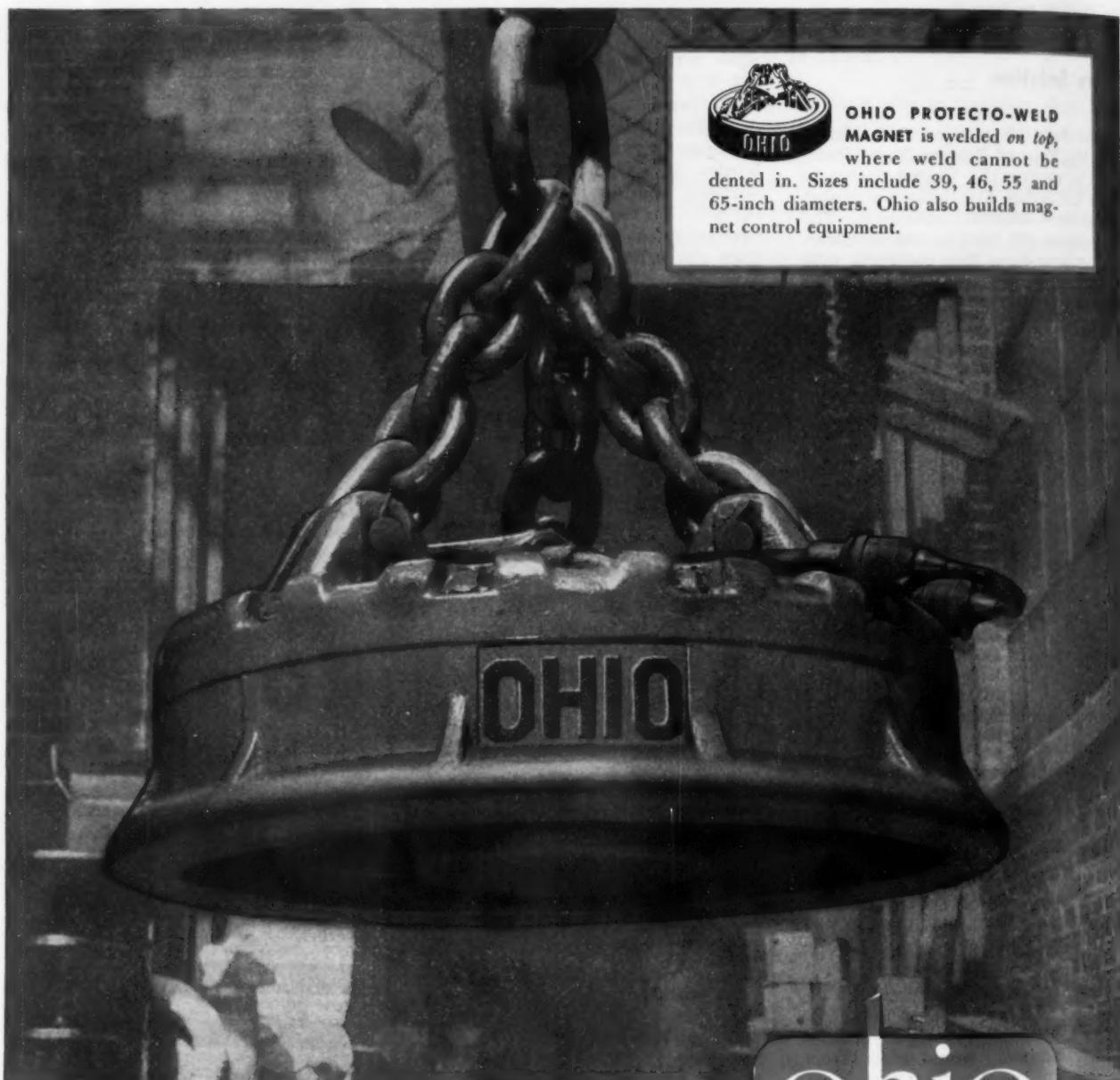
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Upkeep cost? Under \$100—less than \$5 a year for 22 years!

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Conventions & Meetings

Oct. 15-19—National Metal Congress & Exposition, and World Metallurgical Congress, Hotel Statler, Detroit. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

Oct. 18-20—Anti-Friction Bearing Manufacturers Assn., fall meeting, The Homestead, Hot Springs, Va. Association headquarters are at 60 E. 42nd St., New York.

Oct. 20-23—Steel Boiler Institute, fall meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 1207 Land Title Bldg., Philadelphia.

Oct. 21-25—American Institute of Steel Construction, annual convention, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 101 Park Ave., New York.

Oct. 22-24—American Mining Congress, metal mining convention, Biltmore Hotel, Los Angeles. Association headquarters are in the Ring Bldg., Washington.

Oct. 22-24—American Standards Assn., national standardization conference and annual meeting, Waldorf-Astoria Hotel, New York.

Oct. 22-25—Wire Assn., annual convention, La Salle Hotel, Chicago. Association headquarters are at 300 Main St., Stamford, Conn.

Oct. 25-26—Gray Iron Founders' Society, annual meeting, Edgewater Beach Hotel, Chicago. Society headquarters are at 210 National City—E. 6th Bldg., Cleveland.

Oct. 28-30—Conveyor Equipment Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 1129 Vermont Ave., N.W., Washington.

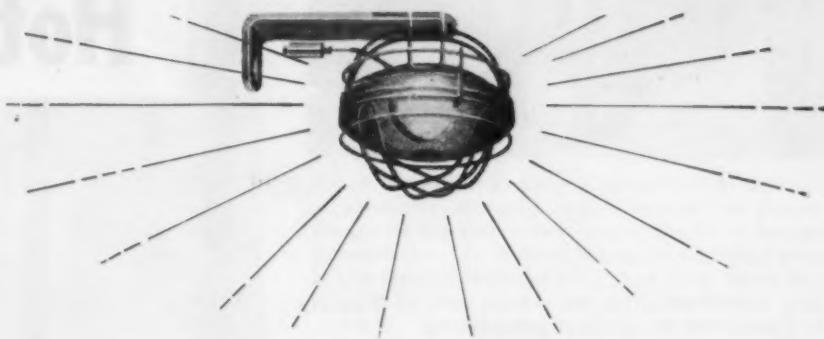
Oct. 29-31—American Gear Manufacturers Assn., semi-annual meeting, Edgewater Beach Hotel, Chicago. Association headquarters are in the Empire Bldg., Pittsburgh.

Oct. 29-Nov. 4—American Institute of Mining & Metallurgical Engineers, fall meeting. Registration at Hotel Del Prado, Mexico City. Institute headquarters are at 29 W. 39th St., New York.

Oct. 31-Nov. 2—Foundry Equipment Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Engineers Bldg., Cleveland.

Nov. 1-2—Industrial Management Society, annual time and motion study and management clinic, Sheraton Hotel, Chicago. Society headquarters are at 35 E. Wacker Drive, Chicago.

Nov. 1-4—National Tool & Die Manufacturers Assn., convention, Statler Hotel, St. Louis. Association headquarters are at 1800 Union Commerce Bldg., Cleveland.



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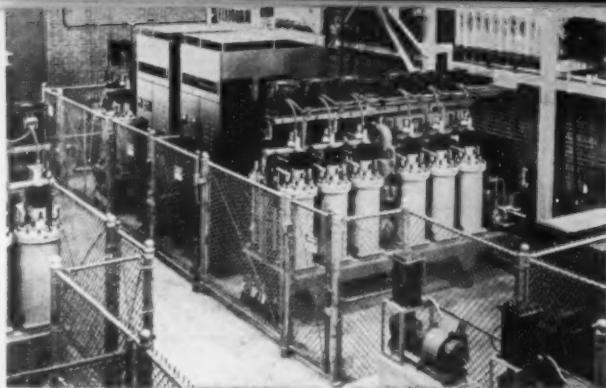
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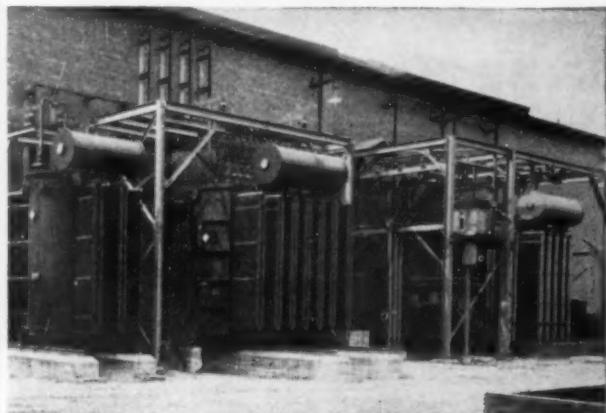
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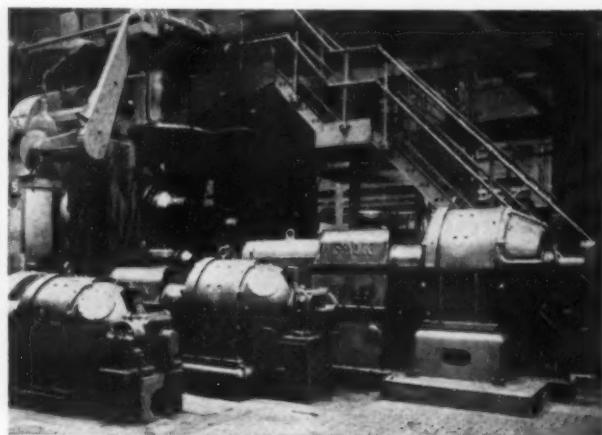
Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.



Interior view of building housing the Allis-Chalmers 16,000 kw mercury arc frequency changer. By-product power—largely generated by Allis-Chalmers steam turbines and gas engines at nearby Gary Steel Works and South Works—is converted from 25 cycles at 23 kv to 1750 volt dc along right side of building. Inverter along left side changes dc to 60 cycles at 6.6 kv linking with the purchased power system.



Allis-Chalmers rectifier transformers, reactors and oil circuit breakers serve the 16,000 kw mercury arc frequency changer. Outdoor equipment on the 60 cycle side is seen above. From left to right: dc reactor, 8000 kw self-cooled transformer, 15 kv, 500,000 kva i.c. oil circuit breaker, and 8000 kw self-cooled transformer.



Seen here is a veteran two stand temper pass mill still going strong after 15 years on the job. Allis-Chalmers dc motor drives, supporting synchronous M-G sets, switchgear, and control are employed on one single stand and four two stand tandem temper pass mills doing all the tinplate temper rolling.

15 Year Old Hot Strip Mill



Allis-Chalmers Helps Gary Sheet & Tin Mill Roll 2,377,274 Tons a Year

AFTER 15 YEARS IN OPERATION, this 80-inch hot strip mill in 1950 rang up a new annual tonnage world record of 2,377,274 tons! Top 8-hour turn was 4,147 tons. Top month was 222,751 tons. Equipment durability cannot be better demonstrated.

Located at the Gary Sheet and Tin Mill of the United States Steel Company, the mill rolls tough stainless steel as well as strip for regular sheet and tinplate products. Allis-Chalmers supplied the complete electrical equipment driv-

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ALLIS

THE IRON AGE Newsfront

► The largest field for alloy conservation in the U. S. is still untapped but Korean war experience could change the picture. Present U. S. jet engines, designed for a service life of 500 hr, use a tremendous amount of critical alloys.

If designers were to ease up on alloy specifications to more nearly approach service life actually experienced under combat conditions—with some regard for domestic training needs—there would be a lot more alloy available for other uses, including a larger number of engines.

► Charles Wilson, mobilization director, has privately said that he is against controls but sees no other way to get the job done. He has indicated that as soon as conditions warrant he will push for decontrols where supply catches up with demand.

If he is successful this would likely mean product by product decontrol instead of waiting for an entire industry to catch up and get into balance.

► Another reason why aluminum foil will expand tremendously after the emergency is a new self-sealing aluminum foil package. It has been used successfully on foods, cigarettes and pharmaceutical products in Europe. A thermoplastic varnish on the inside of the foil melts under heat in packaging to produce an air-tight package.

► Industrialists familiar with military specifications and purchasing privately feel that they should be getting much closer scrutiny than they are. An example of what can be saved is an aircraft parking apron at the Marine Air Corps station, Cherry Point, N. C. It will be built without some 300,000 sq yd of wire mesh and steel bars originally included in the plans. Besides the steel saved, the Navy expects to save over \$250,000 on this project.

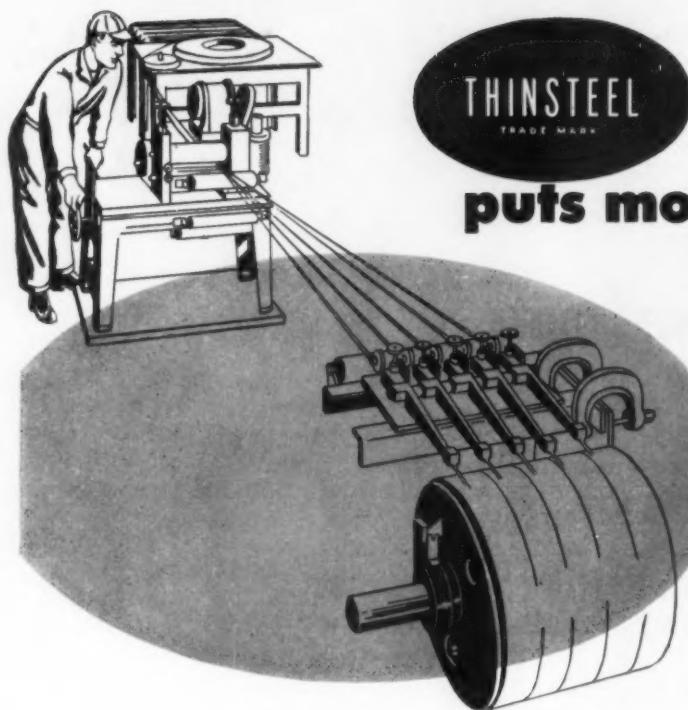
► The cold expansion of 16-25-6 nickel-chrome-molybdenum alloy rims for jet engines has made a tremendous difference in the program. It would have been impossible to meet planned production schedules without this process. Cold expansion does not require large presses or hammers and cold working vastly improves the properties of this high-temperature alloy. Further, the new method means less scrap.

► A 3-year test on aluminum-steel trolley wires in Paris has proved so successful that their use is likely to become standard. The wire is a drawn aluminum-steel combination, not stranded.

► It is fairly certain that the 16,000 houses in Levittown, Pa., near the new Fairless Works will be heated by steel radiant heating piping. This is a departure from the builders' Levittown, Long Island, project, which used copper. Yet they can stay within steel limitation orders.

Elsewhere two radiant heating installations have been made with plastic pipe but temperatures must be held down to avoid damaging the pipe.

► The British may buy about 450,000 net tons of sheets and bars in Japan. It would be an expensive deal: Reinforcing bars sell for about \$130 per metric ton; rails are \$154 a metric ton.



THINSTEEL
TRADE MARK

puts more steel on your reel

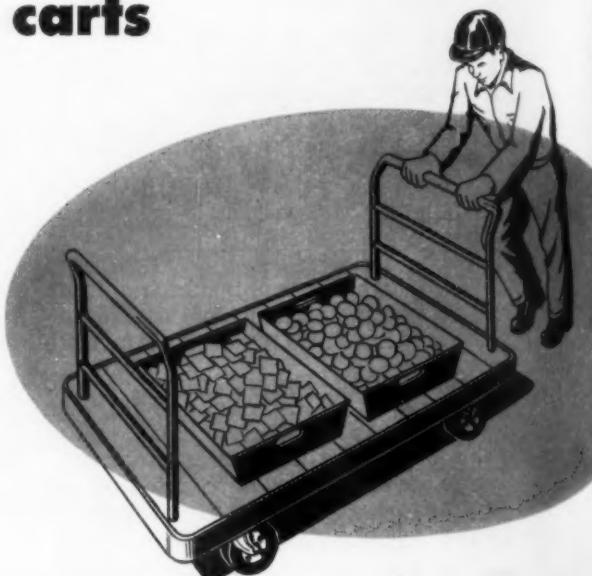
The combination of extra-long coils (200# per inch of width and up) and more ft. per lb. in Thinsteel is a real aid to production scheduling. Because Thinsteel provides the maximum lineal feet of cold rolled strip steel per lb. for thickness specified, in the longest practical coils for the width involved, there are real opportunities to increase production, reduce manufacturing costs, and cut machine down time.

...more parts in your carts

The tangible evidence is found in the increased yield of finished parts per ton of Thinsteel processed. Characteristic of Thinsteel, because of CMP's precision processes, you suffer no footage loss due to oversize variation in gauge.

ANYTIME

So, when you check your present yield, remember that with Thinsteel you can count on the extra footage that adds up to increased production. Of course, today, Thinsteel production is directed first to defense needs but whether for defense or regular civilian end-use manufacture, it is a helpful answer in stretching steel supply.



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RADIANT HEAT: Steel Leads Market Race

Steel pipe makers lead in radiant heating . . . But copper, wrought iron still used . . . Potential market just scratched . . . A. M. Byers was first, steel follows—By W. V. Packard.

Steel pipe makers have jumped into the lead in the radiant heating derby. That is, more steel pipe is being used in radiant heating jobs than any other material.

But this doesn't mean the race for this lush and growing market is over. Far from it. Wrought iron and copper are still being used in a lot of jobs. Two firms are now marketing a highly ductile steel conduit for radiant heating. And two installations have been made with plastic pipe, though heat is a problem with this material.

Labor Saving — Darkhorse in the race is flexible steel tubing. The labor saving potential in installation of this product makes it a serious contender if material costs aren't too much higher than standard steel and lasting durability is proven.

Steel's big stake in radiant heating is being carved out more in

the area of an expanding market than at the expense of other materials. A decade ago those interested in radiant heating could count the installations on their fingers. But today only the very large or unusual jobs attract attention. That's because radiant heating has become commonplace. Yet the potential market area has hardly been scratched.

Credit Byers—Popularity of radiant heating in this country is due largely to the efforts of A. M. Byers Co., Pittsburgh. In 1938 they started pushing wrought iron for these applications and their research and sales promotion efforts paid off in a growing market which they held without serious challenge for 10 years.

It was not until after the war that steel people became really interested in the potential market for steel pipe in radiant heating. They made it a point to get a

few interesting jobs. And finally, in 1949, they jumped into the market with both feet (THE IRON AGE, Mar. 24, 1949, p. 125).

Steel Is Cheaper—Led by Bethlehem Steel Corp. and later by U. S. Steel's National Tube Co. and Jones & Laughlin Steel Corp., the steel pipe makers trained their sales guns on the radiant heating field. The Committee on Steel Pipe Research of American Iron & Steel Institute also lent a hand. The result: In the past 3 years steel has come from nowhere to take the lead—on a tonnage basis.

Price has been a big factor. Steel pipe costs only a little more than half as much as wrought iron. The price spread between steel and copper, of course, is much greater, although this is partly offset by cheaper installation cost of copper. It can be readily coiled, transported, and formed on the job.

Bending and welding account for a large share of installation cost when steel pipe is used. That's why the idea of a highly ductile or flexible steel pipe in-



BIG JOB: This serpentine radiant heating job is being installed by Atlantic Pipebending & Fabricating Corp. in Potdevin Machine Co.'s new plant at Teterboro, N. J. Job will require 86,000 ft of pipe weighing about 82 tons to cover 100,000 sq ft of floor area. Pipe is Bethlehem's Rydact.

ZINC, LEAD: How to Lose Imports

Import ceilings divert metal from U. S. consumers . . . Higher costs not yet compensated by OPS action . . . Business slows as industry gripes at Washington.—By R. L. Hatschek.

New ceilings on zinc and lead, established 2 weeks ago by Office of Price Stabilization, added more confusion to an already muddled industry. No one seemed to object to the 2¢ increase in the price of each metal but, according to industry, Washington made almost every possible blunder.

OPS established import ceilings at the same levels as domestic ceilings, 19¢ for lead and 19½¢ for zinc. This was an attempt to stabilize prices at the same level for everyone. However, the effect of limiting these previously unlimited prices will be to cut imports severely at a time when the country is extremely short of these strategic metals.

Lost Metal—Much metal which could have been imported into the U. S. has been lost to consumers here because of price limitations—the outstanding example being copper, which has sold for double

the U. S. import price in Europe. Lead and zinc have been in similar positions, but U. S. buyers were not limited by law in what they could pay for imports of these metals, and the situation was not so serious.

Now, however, an import ceiling several cents below the prevailing import price has been established and domestic consumers are seeing their vitally needed supplies diverted to other countries. Mexican lead producers are particularly unhappy and have said so. American Smelting & Refining Co., for instance, has refused to sell Mexican lead for the 19¢ ceiling price.

It was apparently assumed that domestic production would immediately rise to help fill the gap left by reduced imports. But production just doesn't rise that fast and we are so short of zinc and lead that we actually need an increase in both production and imports.

No Raises—Another gripe was that the price agency did not immediately permit increases for producers whose costs went up with the ceilings. Under the law, producers must apply to OPS for permission to boost prices when costs rise. It is reported that OPS is working on some sort of an overriding regulation to permit such increases for products containing zinc or lead. But this should have come out with the ceiling revision.

Delay caused a virtual cessation of business transactions and of shipments which would be affected by price revision. Scrap trading in these metals has also stopped as a result of OPS inaction on the price ceilings for scrap.

Slow, Slow, Slow—OPS might excuse itself on the grounds that Defense Mobilizer Wilson ordered the price changes and sufficient time was not allowed to work up a truly comprehensive order—but when hasn't this agency been bogged down by delays?

OPS is rushing on regulations to overcome these difficulties but the government definition of a rush job just doesn't correspond to the industrial version.

Special Report

Continued

trigues engineers and construction people. If such a pipe could be made available at somewhere near the cost of standard steel pipe, they think its market would be terrific.

Little Corrosion—Another problem steel people had to cope with was public belief that steel pipe would be destroyed by corrosion. Fortunately they were able to point to steel pipe in closed water heating systems that had been in place for years without bad corrosive effect. Experience has shown that corrosion is not a serious problem as long as fresh water is not frequently introduced into the system.

Applications—Radiant heating applications include hospitals, schools, garages, airplane hangars, factories and, of course, homes. Largest single development of radiant-heated homes is Levittown, N. Y., which used copper tubing.

Now, another Levittown of 16,000 homes is to be built near the new Fairless Works of U. S. Steel. Plans call for radiant heating with steel pipe. The 2400-acre townsite is on state highway 13 between Morrisville and Bristol, Pa. Modern ranch type slab construction is made to order for radiant heating installation.

Snow melting is another field that has only begun to be tapped.

In addition to sidewalks, plane runways are a potential source of a lot of business.

Costs—Installation costs of radiant heating have been going down, are now, in many cases, competitive with cost of other systems. In a large machine shop now being built installation of radiant heating is actually cheaper than bids received on other systems. Including fuel costs alters the picture in favor of radiant heating.

With the growth of steel pipe in the radiant heating business a lot of pipe bending and fabricating firms have sprung up. They are proving to be some of the best pipe salesmen the industry has.

FARM MACHINES: Output to Drop

Cutbacks in CMP fourth quarter allocations will drop output 15 to 20 pct . . . Inventories to slip so that builders depend on metal rations . . . Farmers buy heavily—By E. C. Beaudet.

International Harvester's pessimistic report on their fourth quarter materials situation last week brought a chorus of "amen" from other leading producers of farm equipment. Reductions of Controlled Materials Plan allotments of steel, copper, and aluminum during the fourth quarter will cut production schedules 15 to 20 pct below the third quarter.

By the end of the year most companies will have reduced their inventories to the point where they will be living mostly on government allocated materials. A further cutback of 30,000 tons will strike in the first quarter 1952.

Actually these reductions are still greater when compared with the first 6 months of the year when production was about 9 pct higher than the third quarter.

Threaten Farm Goals—As a result, shortages of farm equipment are expected to endanger the government's 1952 food and fibre goals. The Dept. of Agriculture claims that fourth quarter output should be at a rate 115 pct of the third if these goals are to be met. This means production will fall 30 to 35 pct below requirements.

In face of this anticipated shortage, farmers are once again going on a buying spree. Sales during this peak selling season are reported abnormally high. Demand for heavy tractors, hay tools, mowers, rakes, balers and combines is out of normal proportion.

Inventories Decline—Once again farmers are upsetting seasonal buying patterns. To insure next year's production they are now buying planting equipment that won't be needed until next spring. Dealers' inventories, built up during the summer months, are steadily declining in face of this demand.

The 1600 makers of farm ma-

chinery in the country produce more than 2000 different products used by farmers. The majority of them are bought on a seasonal basis and when production timing is thrown off producers run into trouble.

Since a great many of these products differ greatly they require different types of steel in varying amounts. When inventories become unbalanced, as is happening now, manufacturers have to scramble to place CMP's with several mills, scour the warehouses or go into the gray market.

Start New Item—When schedules are upset, the producer is faced with two alternatives. He either lets his schedule slip and finishes

the equipment after the selling season is over or he clears the plant of equipment in process to make way for a new product.

In this event, unfinished equipment must be transported elsewhere for completion next year. Some companies report missing the season for corn pickers while others claim to have had to store equipment only 80 pct completed. Under CMP, schedules are harder to plan than ever. Production scheduled 4 to 5 months ahead is threatened by future unknown cutbacks, later approvals of CMP allotments or inability to place tickets with the mills.

Pressure-Top Furnace Sets Record

Republic Steel Corp.'s Cleveland No. 5 blast furnace established a new corporation production record in September. Production for the month was 48,005, a daily rate of 1600 tons or 1.1 tons per min.

Furnace is operated by the high top pressure method.

STEEL: Output of Ingots, Castings Down in September

As Reported to the American Iron & Steel Institute

	Openhearth		Bessemer		Electric		Total		Calculated Weeks	
	Net Tons	Pct. Cap.	Net Tons	Pct. Cap.	Net Tons	Pct. Cap.	Net Tons	Pct. Cap.	Net Tons	in 4 Weeks
1950										
January	7,136,227	98.6	379,252	80.6	426,318	73.0	7,941,797	94.0	1,792,731	4.43
February	8,145,634	92.1	255,565	80.2	401,833	76.2	6,803,032	89.2	1,700,758	4.00
March	8,750,884	91.3	285,726	56.5	481,212	82.4	7,497,822	88.8	1,632,511	4.43
1st Quarter	20,032,745	93.4	900,543	65.9	1,309,363	77.3	22,242,651	90.7	1,729,600	12.86
April	7,318,720	102.3	407,909	89.5	487,675	88.1	8,224,504	100.6	1,917,134	4.29
May	7,601,880	102.9	437,000	92.9	525,321	90.0	8,564,207	101.4	1,833,230	4.43
June	7,222,185	100.9	406,944	89.3	514,101	90.9	8,143,230	99.6	1,898,189	4.29
2nd Quarter	22,142,785	102.0	1,251,850	90.6	1,537,297	89.7	24,931,941	100.5	1,916,367	13.01
1st 6 months	42,175,530	97.7	2,152,402	78.3	2,848,660	83.5	47,174,592	95.7	1,823,525	25.87
July	7,224,306	97.0	380,317	79.8	478,298	79.7	8,082,922	94.8	1,828,715	4.42
August	7,318,908	98.0	405,118	84.8	518,148	86.1	8,242,174	96.5	1,860,536	4.43
September	7,262,359	100.7	409,216	88.7	533,422	91.7	8,204,997	98.4	1,917,055	4.28
3rd Quarter	21,805,573	98.6	1,194,681	84.4	1,529,869	85.8	24,530,083	96.9	1,868,240	13.13
9 months	63,981,103	98.0	3,347,053	80.4	4,376,529	84.3	71,704,685	96.1	1,838,582	39.00
October	7,734,714	103.6	436,835	91.5	581,137	96.6	8,752,686	102.4	1,975,776	4.43
November	7,111,829	98.4	370,659	80.1	540,905	82.8	8,023,393	97.0	1,870,255	4.29
December	7,434,863	99.8	380,011	79.8	540,437	90.0	8,355,311	98.0	1,890,342	4.42
4th Quarter	22,281,408	100.6	1,187,505	83.8	1,662,479	93.1	25,131,390	99.2	1,912,587	13.14
2nd 6 Months	44,086,979	99.6	2,382,156	84.1	3,192,348	89.4	49,661,483	98.0	1,890,426	26.27
Total	86,262,509	98.7	4,534,558	81.3	6,039,008	85.5	96,836,075	96.9	1,857,232	52.14
1951 ¹										
January	7,844,982	101.4	431,725	90.4	566,460	88.3	8,843,167	99.9	1,996,200	4.43
February	6,035,512	99.3	326,112	75.6	504,077	87.0	7,765,701	97.1	1,941,425	4.00
March	8,059,625	104.2	408,926	85.6	602,504	93.9	9,071,055	102.4	2,047,642	4.43
1st Quarter	22,840,119	101.7	1,166,763	84.2	1,673,041	89.8	25,679,923	99.9	1,996,884	12.86
April	7,857,161	104.9	392,472	84.9	580,888	95.1	8,840,521	103.1	2,060,728	4.29
May	8,071,270	104.3	408,650	85.6	814,579	95.7	9,084,499	102.7	2,052,934	4.43
June	7,867,811	102.3	403,001	87.1	586,148	94.3	8,656,960	100.6	2,017,930	4.29
2nd Quarter	23,596,242	103.9	1,204,123	85.9	1,791,615	95.0	26,591,980	102.2	2,043,968	13.01
1st 6 Months	46,438,361	102.8	2,370,886	85.0	3,464,656	92.4	52,271,903	101.1	2,020,561	25.87
July	7,704,433	99.8	411,599	86.4	563,215	87.9	8,679,247	98.2	1,983,631	4.42
August ²	7,693,322	99.4	436,822	91.5	603,448	94.0	8,733,592	98.6	1,971,465	4.43
September ²	7,645,000	102.3	405,000	87.8	594,000	95.8	8,644,000	101.0	2,020,000	4.26
3rd Quarter ²	23,042,785	100.5	1,253,421	88.6	1,780,863	92.5	26,056,839	99.3	1,984,527	13.13
9 Months ²	69,479,116	102.0	3,624,307	86.2	5,225,819	92.5	78,328,742	100.5	2,008,429	39.00
October										
November										
December										
4th Quarter										
2nd 6 Months										
Total										

Note—The percentages of capacity operated (1951) are calculated on weekly capacities of 1,746,337 net tons open hearth, 107,806 net tons Bessemer and 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons: based on annual capacities as of January 1, 1951 as follows: Open hearth 91,054,020 net tons, Bessemer 5,621,000 net tons, Electric 7,554,630 net tons, total 104,229,650 net tons.

¹ Revised.

² Preliminary figures, subject to revision.

REBUILT TOOLS: Safeguards for Buyer

OPS order sets standards for rebuilt machine tools . . . Re-builders unite to press for established standards . . . Used machine tool market on the whole stabilized—By T. Metaxas.

Manufacturers seeking to equip their plants for war production with rebuilt machine tools will now have a guarantee of quality and performance. They will also be able to purchase other used tools in a stabilized market whose prices are based on percentages of new machine tool prices as of Jan. 25, 1951.

The new Office of Price Stabilization special pricing order (CPR 80) for the used tool field sets rigorous procedures to be followed before a machine can be sold at the higher prices reserved for the rebuilt category. This rebuilding code is designed as insurance of standard quality and performance equal to the comparable new tool.

Here to Stay?—The code could become the forerunner of rebuilding standardization and buyer recognition of authentic rebuilding. It may also force many machine dealers with limited shop facilities to reequip for complete rebuilding or slip permanently into the reconditioned sales classification.

Organization of several large rebuilders into the National Machinery Rebuilders Assn. and their significant membership into the American Standards Assn. unifies their long-term campaign to standardize rebuilding and gain recognition for the genuinely rebuilt tool. They are regarded as responsible for inclusion of the rebuilding, reconditioning clauses into the OPS pricing order.

To classify as rebuilt, machine tools must be completely dismantled, worn or broken parts replaced, worn surfaces machined, and performance tested under power to compare to that of the new tool. A machine that undergoes that treatment emerges as

practically a new tool. But only comparatively few firms have facilities for so thorough an operation.

Reward for Effort—If manufacturers continue to look for these standards after controls die out and the new rebuilding group presses the fight, other dealers may equip their plants to rebuild.

Rebuilders feel that they should be compensated for their extra work and the manufacturer should be protected by standards in rebuilding that outlaw sales shenanigans and inaccurate claims.

Those dealers who may have guaranteed good machine tools as rebuilt point out that their prices were hardly equivalent to much higher prices asked by rebuilders for their "new" tools. All things tend to equalize themselves in a competitive system, they say.

Delivery Time—However, many manufacturers have avoided some parts of the rebuilt market because of uncertain machine tool performance. They did not want to chance pig-in-a-poke buying.

Despite materials shortages and tightness of labor, rebuilding has been flourishing since Korea. Delivery times even in defense-pressed areas such as Detroit and San Francisco are reasonable when compared to new tool deliveries.

The established rebuilders are saying privately that many used machine dealers who made rebuilding claims will have to downgrade their tools to reconditioned status. This may provide them incentive for entrance into total rebuilding.

Favor Standards—New machine tool builders are in favor of rebuilding standards. In the more normal market they sometimes rebuild their own machines to fill out their order books. They don't want the paint, polish, and salesmanship competition.

Rebuilders see an active market for their services in the next few years. Defense production will be the mainstay. Although Air Force machine tool reserve depots at Omaha and Marietta, Ga., are scheduled for exhaustion on Oct. 29 or so, it is now strongly rumored that the Air Force has another warehouse still untapped. Whether this exists or not, rebuilders can draw on a vast amount of older machine tools scattered across the country.

Practical Foundry School Held

First industry-sponsored school in practical foundry work and casting design for designers, draftsmen, purchasing agents and other non-foundry personnel was held in Providence, Sept. 17-21. Sponsor was Builders Iron Foundry, which ran the school in its own foundry.

The course was originally scheduled to be given once a year, with enrollment limited to 25. But when invitations went out to BIF customers, the company was swamped with requests.

First class finally contained 30. Interest has been so high that BIF will probably run another class this spring instead of waiting a year.



COAL: Demand Has Industry Busy

Defense, European aid keep industry busy . . . Mechanization now the keynote . . . Research not neglected . . . Labor policies healthy . . . Demand seen increasing—By J. B. Delaney.

King Coal is busy. Chief reasons: the defense program and aid to Europe.

The soft coal industry is snapping out of its spring and summer doldrums in fine style. Employment is picking up. Outlook for 1952 is good.

Coal people are anything but pessimistic. Domestic stockpiles are high, to be sure, and competition is such that prices are 5 to 10 pct below permissible ceilings in many areas.

Good Relations—But the industry is far sounder today in many ways than it has ever been. It feels that its labor relations are good, and likely to remain so. Smooth settlement of last year's contract negotiations with the United Mine Workers of America is felt to be a tip-off that the days of bickering and strikes are behind them.

Producers are mechanizing to the hilt. More money is being spent on research and development of newer and better mining, loading, and washing equipment.

Between 75 to 80 pct of the industry is now mechanized, with the blessing and encouragement of the UMW. Where 450,000 miners produced 390 million tons of coal in 1940, 400,000 workers produce 530 million tons today.

Power Needs Help—The industry is spending money in other phases of research, including moving of coal by pipeline. It is cooperating with railroads, electric power utilities, and other industries in developing smokeless power plants. Transformation of coal into gasoline and other "synthetic" fuels is also being investigated.

Coal producers feel there will

always be a good market for their product, come what may. They point to increasing demand for electrical energy, generated principally from coal. Westinghouse engineers estimated recently that the nation's use of electricity will double in the next decade.

Foreign Oil Hurts—Dumping of foreign residual fuel oil into this country hurt the coal industry during 1949-1950, particularly on the East Coast. Many normal consumers of coal switched to oil to take advantage of the low cost; some of them now wish they hadn't and are swinging back to coal. The reason: More oil going to the Orient; troubles in the Near East.

This year the U. S. will consume approximately 475 million tons of bituminous, 10 pct more than 1950 consumption. Exports of 50 to 55 million tons will raise total consumption to about 525 million tons.



"Now you see why we're behind on deliveries."

1952 Looks Good—Thanks to the defense program and aid to Europe, outlook for next year is just as good. U. S. consumption will be comparable to 1951, with exports approaching the 1947 record of more than 68 million tons.

Stocks in the hands of domestic consumers continue high, although reserves declined from 71 days on Aug. 1 to 66 days on Sept. 1. At that time, principal consumers held these inventories: electric power utilities, 116 days; coke ovens, 51 days; steel and rolling mills, 62 days; cement mills, 59 days; Class I railroads, 35 days; other industrials, 87 days.

Employment was off during the spring and summer, particularly at mines producing for retail sale. But with overseas exports increasing from about 1 million tons per month to approximately 3 million tons, the picture has brightened. The pickup in exports has been especially helpful to the South, with its easy accessibility to Hampton Roads. The northern mines will also benefit.

Lignite Gas Yield High in Test

About 10,210,000 cu ft of potential industrial gas were produced from lignite during the 18th experimental run recently completed in the Federal Bureau of Mines pilot plant of the Department of the Interior at Grand Forks, N. D. The test run, longest to date, shut down after 947 hours of successful operation.

The run used 438,415 lb of lignite donated by six mining companies. The railway provided free transportation of the lignite to the plant. About 85 million cu ft of gas had been produced during the 18 test runs that have been made since the pilot plant began operating in 1945.

The gas, which may provide a way to make greater use of the country's lignite reserves, could be used in producing synthetic liquid fuels, reducing Minnesota iron ore, manufacturing ammonia for fertilizer for agricultural use, and for the hydrogenation of vegetable oils and fats.

JETS: Save Alloys With Air Cooling

NACA's Lewis Labs develop new system of air cooling jet engines . . . Saves alloys . . . Up heat resistance of carbon, low alloy steel . . . Liquid cooling research—By W. W. Taylor.

When metallurgical research for alloy steels capable of withstanding fiery jet engine temperatures and yet using tiny amounts of critical alloying materials was deemed not sufficiently successful, research men at Lewis Flight Propulsion Labs of the National Advisory Committee for Aeronautics, Cleveland, switched to another tack—air cooling jet engines.

It was also learned by THE IRON AGE that other quarters are developing liquid-cooled jet engines. With this clever system the jet fuel would cool the jet blades and at the same time be preheated for combustion. Liquid-cooling research, however, is seen as being about 2 years away from completion.

Air Cooling — In more than 3 years of research with both air and liquid coolants Lewis Labs engineers have developed an air cooling system for jet engines that promises to result in larger alloy savings. By reducing jet heat, use of steels with a fraction of alloys needed to build up stout heat resistance is possible.

This development was the most interesting of many mentioned during the 3-day biannual inspection of NACA at the Cleveland airport. More than 1200 engineers, industry representatives, scientists, aircraft producers, and military men saw the \$100 million research plant in operation.

Research into problems of jet engine design, fuel, materials, measuring devices, and instrumentation were explained to the visitors.

With supplies of alloying mate-



PRECISION: E. F. Champayne, Research & Control Instruments Div., North American Philips Co., Inc., explains operation of a wide-range goniometer at his firm's eleventh semi-annual X-ray diffraction school. Course was given at Philips' Mount Vernon, N. Y., plant. Over 100 scientists and technicians attended.

rials growing scarcer because of sharply increased needs of defense, jet engineers have had to cope with problems of building engines.

Use Carbon Steels — Jet engineers had to cope with the problem of making efficient engines while supplies of alloying elements became inadequate because of greater defense need. Elimination of high temperature alloy steels in fabricating turbine blades and wheels has met part of the problem. But Lewis Labs engineers went on from there to work on the air cooling principle.

They claim their new system enables a carbon steel or a 3 pct alloy steel to withstand temperatures exceeding 1500°F.

As a result higher operating temperatures can now be utilized, increasing potential engine power, or thrust, from 5000 lb per sq in. to 7000. Some jet engine manufacturers are now working on experimental models of new air-cooled blades before putting them into actual production. In the meantime, research at Lewis Labs will continue.

Financial

Seeks to Register Nickel Stock

Fourth quarter export quotas for nickel have been announced by the Office of International Trade as follows:

Sched. B Nos. 654505 and 654509 (semifinished, alloys, and scrap), 62 short tons; Sched. B No. 654998 (new nickel catalyst), 10 short tons.

Under the customary agreement, Canada will ship about 485 short tons to the United States for processing before trans-shipment to England.

Sharon Stock to Finance Growth

To help finance further expansion and improvements and to provide increased working capital, Sharon Steel Corp. will offer 174,137 additional shares of common stock for sale. This would

raise capital stock outstanding to 1,100,000 shares. Sale would be made through a group of underwriters headed by First Boston Corp.

During the balance of 1951 and 1952, the company plans to spend approximately \$15 million for such additional improvements and facilities as new diesel switching locomotives and yard cranes, a turboblower for blast furnaces, a continuous zinc coating unit for strip steel, a 24-in. multiple cluster Sendzimir cold reduction mill, a 2-high skin pass mill, additional pickling and annealing facilities.

Since 1945 Sharon has spent approximately \$29.5 million for expansion and improvement purposes including purchase of its works at Farrell, Pa., now known as the Roemer Works, where

\$16.5 million has been expended. Annual pig iron capacity has been increased from 148,620 to 709,620 tons and ingot capacity upped from 510,000 to 1,441,400 tons.

Pitts. Steel Declares Dividend

For the first time in 21 years, Pittsburgh Steel Co. has declared a common stock dividend—a 2 pct stock dividend—and will seek authorization from stockholders Dec. 5 to increase common shares by 1 million and prior preferred by 174,073.

Directors decided against a cash common dividend in order to conserve cash for expansion spending. Also declared were dividends of \$1.375 and \$1.25 on the prior preferred and Class A preferred, respectively. All dividends are payable Dec. 1 to holders of record Nov. 9.

There are no immediate plans to issue any stock other than that required for payment of the stock dividend and for a stock option plan for key employees.

Expansion Financing O.K. Asked

Stockholders of Allegheny Ludlum Steel Corp. will vote Dec. 4 on a proposal to increase authorized company indebtedness to \$40 million from \$20 million. The board of directors also is considering issuance of 81,000 shares of convertible preferred stock to assist in financing expansion.

Allegheny Ludlum, with a \$34.5 million expansion program already underway, decided recently to spend an additional \$16.5 million for this purpose.

E. J. Hanley, president, said the company at present has no intention of incurring indebtedness beyond \$27.2 million, but wants to be in a position to act quickly should further expenditures be necessary.

To Enlarge Jet Engine Parts Plant

Bingham-Herbrand Corp. will spend \$1 million on an addition to its plant at Fremont, Ohio, for the manufacture of jet engine parts, buckets and blades. On completion of the new addition, it is estimated that approximately 500 workers will be added to the company's payroll.

Labor

Steelworkers:

Sponsor 4-day Human Relations Conference at Penn State.

Fifteen years ago any suggestion that the CIO-United Steelworkers of America might some day take time out to talk about and analyze the broad field of human relations would have been laughed at.

Yet last week at Pennsylvania State College top officials of the union spent 4 days discussing this subject. Participating with the union were outstanding figures in education, religion, industry, politics, and science.

Basic purpose of the meeting was to explore the various ways that might be used to minimize or eliminate discrimination for any reason—race, religion, union membership, etc. Union leaders freely admitted that the union, at least some of its members, were just as guilty as other groups. At the same time it was pointed out that progress has been made, but there is still much to be done. Union hopes to clean its own house and at the same time work to eliminate bias in other directions.

Philip Murray, union president, pointed out that this country has had world moral leadership thrust upon it. He stressed the urgent necessity of eliminating discrimination both at home and abroad.

Subjects discussed by various speakers included human relations in industry, man's basic rights, what we know about changing attitudes and prejudices, and discrimination—it's nature and forms.

How Much Between Jobs?

Wage Stabilization Board expects to issue late next week its recommendations on the one remaining unsettled issue in the dispute between the American Smelting and Refining Co. and the CIO United Steelworkers.

WSB on Sept. 13 recommended that a general across-the-board increase of 8¢ per hr be paid, that the parties solve the intra-plant inequities problem through collective bargaining, and that they

negotiate further on the issues of improved pension, health and welfare, and holiday benefits.

The wage increase has been put into effect, and fringe benefits are being discussed. Question now to be settled is the amount of increment between job classes.

South Chicago Strike Settled

Striking workers in the No. 2 and No. 4 openhearth shops of United States Steel Co.'s South Chicago Works returned to their jobs last week.

Six-day strike resulted in the loss of 55,000 tons of ingots. Casting crews returned to work after a grievance over disciplinary action against an employee for faulty workmanship had been settled.

More Pay as Job Bait

A Wage Stabilization Board study group has recommended over-ceiling wage increases of up to 77¢ per hr for 75,000 tool and die workers. The increases are necessary, the group said, to attract urgently-needed workers to the industry.



JOB HUNTING: Thomas Hughes (left) and Leon Ziomek (right), war veterans, apply for jobs at Fibrous-Glass Insulation Co., Wilkes-Barre, Pa. Both were soon hired. William A. Betterly, president of the company, hires only disabled vets. He's made 30,000 vital aerial parachute packs in past few months on Air Force contract without a single rejection. This surpasses all records previously set by able-bodied workers.

CMP: Issue First Quarter Tickets

Authorize 20,880,000 tons of steel . . . Another 2.3 million for MRO, emergencies . . . This is 112 pct of estimated supply . . . Copper, aluminum rations top supply—By K. Rannells.

Defense Production Administration has authorized issuance of first quarter CMP tickets for 20,880,000 tons of steel. An additional 2,334,000 tons will be reserved for emergencies and self-certified MRO orders.

This adds up to 112 pct of the estimated available supply of about 21,125,000 tons.

Officials are gambling on maintenance of a high production rate, and that all tickets issued will not be cashed. In this event, there will be just about enough steel to balance.

Figures Conflict—In this respect, DPA figures of steel production conflict with those of the Office of Defense Mobilization. The ODM expects first quarter production to rise by almost 1,000,000 tons, but DPA estimates a reduction of 200,000 tons from fourth quarter, based on the steel industry's figures.

Some 243,216 tons have been allocated to the National Production Authority's Iron & Steel div. Production of structurals is expected to increase during the quarter by 100,000 tons. Allocations for plant expansion will be boosted by 50,000 tons over fourth quarter.

Authorized CMP tickets for 1,367,000,000 lb of copper products will be issued, about 110 pct of estimated supply. Aluminum tickets will be run 110 pct also—about 646,000,000 lb.

Production of consumer durables is slashed about 10 pct from fourth quarter levels, but copper and aluminum shortages may in themselves reduce the level still further.

Car Production—Automobile production is authorized at the 1,000,000 unit level—but the allocations of controlled materials are

only sufficient for about 930,000 vehicles on the basis of the present production ratio of car sizes. Materials on hand and some production shifts might bring the total closer the 1,000,000 authorized.

See pp. 73, 75 for stories on analysis of CMP flaws by steel industry leaders and significance of cutbacks to civilian producers.

Enough steel will be made available to support freight car production at 18,000 units for the quarter. This does not include materials for 2000 tank cars and 1500 more for export and industrial use.

Allocations for construction are slightly boosted above fourth quarter, but aluminum supplies are down.

Ship construction allocations are near the fourth quarter levels, but well below requirements. Limiting factors are scarcities of plate and structural shapes.

More for Tools—Machine tool manufacturers get increased allotments, but agricultural equipment levels are reduced slightly, as is the case of steel for hospital, school, and other institutional construction.

The tonnage increases or decreases in carbon steel allocations from the fourth quarter for some major production programs are as follows:

Defense Dept., up 349,000 tons.

Passenger cars, down 183,000 tons.

Petroleum Administration for Defense, down 73,000 tons.

Defense Power Administration, up 3,000 tons.

Consumer durables, down 5,000 tons.

Agricultural machinery, down 30,000 tons.

The official CMP list of claimant agencies and allotments of basic metals is as follows:

CMP ALLOTMENTS—FIRST QUARTER			
Claimant Agency and Program	Total Steel (Tons)	Total Copper, Base Alloys (000 lb)	Total Aluminum (000 lb)
Program Allotments			
Dept. of Agriculture	43,350	2,440	100
Dept. of Army	35,200	1,325	100
AEC	141,050	8,515	1,000
Civil Aero. Admin.	17,077	735	100
Dept. of Defense	2,408,700	297,000	250,000
Defense Elec. Power Admin.	309,550	79,050	3,000
Defense Fisheries Admin.	1,082	31	1
Defense Minerals Admin.	36,927	1,605	200
Defense Solid Fuels Admin.			
Coke Ovens	17,258	400	70
Coal Mines	9,096	213	11
Defense Transport Admin.	63,253	1,750	200
Federal Civil Defense	2,238	65	...
Federal Security Agency			
Education	96,296	3,897	10
Hospitals	64,123	2,583	400
GSA	24,014	640	100
Housing & Home			
Fin. Agency	88,700	5,078	250
Dept. of Interior	12,230	175	61
Maritime Admin.	100,975	4,840	100
OIT-ECA	652,500	10,435	2,000
Pet. Admin. for Defense	1,708,500	8,300	150
Bureau of Public Roads	201,520	900	250
Veterans Admin.	12,305	1,837	50
NPA Industry Div.			
Agriculture Mach. & Impl.	527,100	7,800	6,500
Aircraft	12,400	1,708	6,000
Aluminum & Mag-nesium	12,850	...	100
Building Materials	1,113,100	51,850	45,300
Canadian	415,050	4,600	3,150
Chemicals	314	1,584	5,000
Communications	39,550	47,230	3,500
Construction Machinery	487,654	7,220	2,400
Consumer Dur. Goods	870,260	38,220	49,000
Containers & Packaging	1,682,250	258	19,000
Copper	43,250	3,300	2,200
Electrical Equip.	586,710	147,169	24,250
Electronics	75,385	33,760	18,000
Engine and Turbine	580,500	29,930	3,900
NPA Facilities Bureau (Industrial & Commercial Construction, etc.)	712,700	28,886	7,000
General Components	1,089,500	172,074	18,000
General Industrial Equip.	500,436	41,905	17,000
Iron and Steel	243,216	17	...
Leather & Leather Prods.	11,740	1,668	1,200
Lumber & Lumber Prods.	6,840	175	1,000
Metalworking Mach. & Equip.	556,000	38,028	7,000
Mining Mach. & Equip.	114,661	3,288	250
Misc. Metals & Minerals	2,518	1,159	35
Motion Picture Photo Prods.	7,990	1,206	3,200
Motor Vehicle	3,054,131	128,055	17,150
Ordnance & Ship-building	95,870	7,276	1,250
Printing & Publishing	10,650	1,105	500
Pulp, Paper, Paper Board	1,170	23	25
Railroad Equip.	1,640,750	86,360	6,000
Rubber	30,533	4,023	950
Scientific & Tech. Equip.	45,490	40,380	15,000
Service Equipment	46,397	2,863	3,700
Textile		No Requirements	
Tin, Lead & Zinc		3	...
Water Resources	158,152	3,633	175
Reserves for Program MRO-Self-Certification, Field Cases & Small Users	2,334,426	105,159	43,833

Controls

Industry Controls This Week:

NPA Orders

M-11, Dir. 1—Revoked. Inventory replenishment of copper and brass mill products now covered by M-82 and M-86.

M-47A, Amend.—Extends ban on ornamental use of copper and aluminum.

OPS Orders

GCPR and CPR 30—Applicability to shipbuilders suspended.

Supplementary Reg. 4, GCPR, Amend. 2—Allows tidewater coal deck dealers to reflect transportation increases in ceilings.

Supplementary Reg. 57, GCPR, Amend. 1—Raises lcl latex prices.

CPR 30, Supplementary Reg. 2, Amend. — Extends to Nov. 15 the deadline for machine tool manufacturers to file Form 8.

CPR 80—Sets pricing standards for used and rebuilt machine tools. Percentage of new pricing.

Shipbuilders' CPR Changes Coming

Builders and converters of ships may find themselves under a new pricing regulation within a short time.

Office of Price Stabilization is making a study to determine what kind of regulation will meet the customary operations and needs of the industry. As an interim measure, OPS has suspended application to shipbuilders of Ceiling Price Reg. 30 and the General Ceiling Price Reg.

This suspension, the agency says, will run for 60 days from announcement of the suspension, "or such earlier date as may be specified by a regulation issued by OPS."

Affected by the relief order are builders' sales of any new ship, barge, canal boat, lighter, or tug, 65 ft or more in length, and repair and conversion of the same type and size of craft.

OPS says its consideration of a new regulation is necessary to remove any possible obstruction in the cargo-ship program.

Coils discharged from coiler against curved bumper are banded on roughed conveyor in foreground. A Combination By-Pass Side-Tilter then transfers them to line in background for delivery to other operations.



"The area of greatest waste," according to authorities, "is in materials handling. About one out of three dollars of production cost goes for handling and moving materials. Usually the cost and personnel used for material handling can be cut in half by mechanization and scientific planning."

The above quotation constitutes a powerful recommendation for Logan Conveyors. Perhaps your plant, too, can cut handling costs with Logan Conveyors to (a) keep equipment operating at capacity with a minimum of manual effort (b) deliver material to operators at convenient working height (c) save time and effort between processes (d) cut costs right down the line.

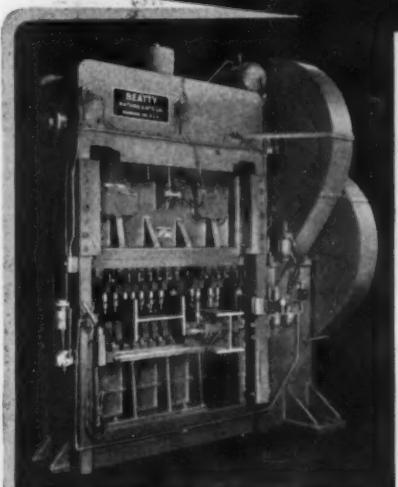
Logan offers two generations of conveyor experience. Write for literature or for nearest engineer to call.



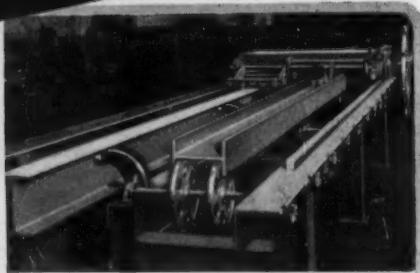
Logan Conveyors

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

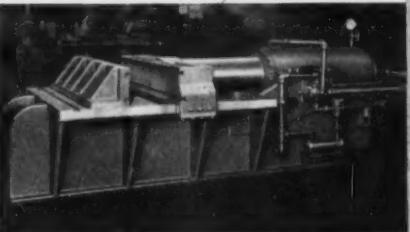
Five ANSWERS looking for a PROBLEM



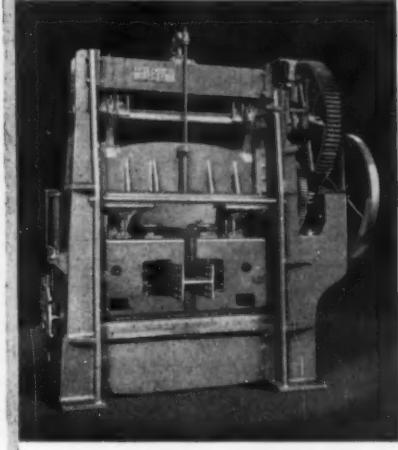
BEATTY No. 9 Guillotine Beam Punch for flange and web punching of beams up to 30".



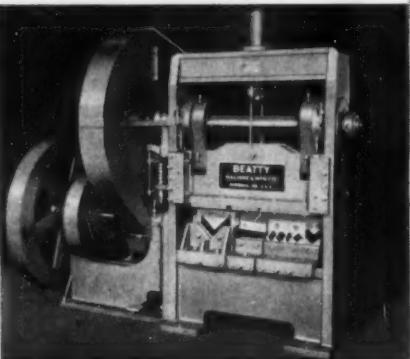
BEATTY Spacing Table handles flange and web punching of beams without roll adjustment.



BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.



BEATTY Adjustable Flange Punch Tools punch all 4 flanges of I-Beams and wide flange beams at one pass through.



BEATTY Guillotine Bar Shear for "short-order" shearing of flats, squares, rounds without changing tools.

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These five Beatty machines are speeding production, cutting costs in a lot of metal working plants. Perhaps one of these basic designs can be modified to meet your special needs. But if not there are more ideas where these came from. Let us know your problem and we will make a proposal. Our long and varied experience in machine design can be valuable to you.

Controls

Tidewater Coal Prices Raised

Tidewater coal dock dealers will be able to add to their ceiling prices the dollars-and-cents hikes in transportation fees charged by rail and water carriers between July 1, 1951, and next Jan. 1.

Immediate effect of this new authorization from Office of Price Stabilization will be adding of the 47¢ gross ton increase which has been recorded since June 30. The financial condition of the tide-water dealers, OPS said, would not allow absorption of this increase without a ceiling price rise.

Authority for the ceiling price change appears in Amendment 2, Supplementary Reg. 4, to the General Ceiling Price Reg. It is, in effect, an extension of the cut-off date on transportation cost increases permitted by Amend. 1.

Auto Parts Meeting to Air Beefs

Representatives of the automotive replacement parts manufacturing industry have a tentative date in Washington on Oct. 22 with Office of Price Stabilization officials, to discuss specific industry problems requiring a tailored pricing regulation.

Attitude of the industry is that pricing under Ceiling Price Reg. 30 is impractical and overly complicated. As an interim measure, representatives have recommended that CPR 30 be amended to permit ceilings to reflect labor and material cost increases up to last July 26.

Extend Ornamental Copper Ban

National Production Authority has effected a routine amendment of M-47A which retains indefinitely the ban on use of copper and aluminum for decorative or ornamental purposes.

In another routine action, NPA revoked Dir. 1 to M-11 because it is unnecessary since issuance of M-82 and M-86. The latter orders permit distributors to replace stocks of brass mill and wire mills products which have been sold out of inventories on authorized materials orders.

Controls

Against Controls:

GM's Wilson favors free market even in defense . . . Notes defense needs.

C. E. Wilson, president of General Motors, is in favor of removing controls during the defense period. In his speech last week at Dallas, Tex., entitled "The Camel's Nose Is Under the Tent," Wilson declared it is unthinkable that our only hope of getting rid of controls will come at the end of another big war. Wilson contends the U. S. will sacrifice its free society if controls are long continued.

According to the GM president, the steel shortage has been used to justify controls and restrict commercial production. By using the threat and fear of inflation to justify wage and price controls, he asserted, the economy of the whole nation is being placed unnecessarily under increasing regulations.

Wilson asked why all steel should be rationed when the Korean war is taking less than 10 pct of the country's steel production. Defense production at its maximum planned rate, he said, will probably not require more than 15 or 20 pct of the country's steel capacity. The rationing of steel is directly contrary to the recommendations of the steel industry itself, Wilson argued.

Latex Prices Raised by OPS

Sales of synthetic rubber GR-S latex in less than carload lots will be made at higher prices, based on Office of Price Stabilization action permitting the recent 1.5¢ per lb increase in the government price to be passed on to customers.

This authorization affects primarily Office of Rubber Reserve licensees and the companies to which they sell. The Rubber Reserve agency itself sells the liquid-form latex only in carload lots.

The order allowing sellers the price increase is Amendment 1, Supplementary Regulation 57, to the General Ceiling Price Regulation.

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Yes, here's your chance to see for yourself the braided wire fabric of which TUFFY Slings are made. Tie it in knots, kink it—then see how easily a Tuffy sling can be straightened out without material damage.



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HOW TUFFY SLINGS ARE MADE

Scores of wires are stranded into nine parts, then machine woven into an interlaced wire fabric. This braided fabric gives extra safety and enduring strength. Even cutting one of the 9 parts does not result in stranding of the sling.

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There are 11 different types of Tuffy Slings, each one proof-tested to twice its safe working load. And the safe working load is plainly marked on metal tags on each sling. Also, Union Wire Rope engineers will help work out special sling problems. If you have your own rigging loft, Tuffy braided wire fabric is available by the reel.

FREE SAMPLE—MAIL COUPON

To show you the difference between TUFFY Braided Wire Slings and ordinary wire rope slings, we have made up a quantity of 3-foot slings. We want you to have one so that you can test it and prove to yourself that TUFFY Slings really are better. Mail the coupon below today for yours.



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Defense Contracts

Contracts Reported Last Week

Screws, Wood—Continental Screw Co., New Bedford, Mass.

Screws, Wood Slotted—James Walker Co., Baltimore

Rate Gyro—G. M. Giannini & Co., Inc., Springfield, N. J.

Power Unit—Minneapolis-Honeywell Regulator Co., Minneapolis

Parts, Aviation—Ruffe Inc., Miami, Florida

Locks, Swinging Door—Reese Padlock Co., Lancaster, Pa.

Valve Assembly—Wm. R. Whittaker Co., Los Angeles

Flashlights—United States Electric Mfg. Co., New York

Shaft Joint—Dana Corp., Toledo

Trailer, Pole Handling—Eagle Mfg. Co., Appleton, Wis.

Replenishment of Tank and Vehicle Parts—Paramount Rubber Co., Detroit

Replenishment of Motor Vehicle Parts—Austin Metal Prod., Inc., Detroit

Replenishment of Tank and Combat Vehicle Parts—Motor Wheel Corp., Lansing, Mich.

Frangs, Pinion, Spur—Ward LaFrance Trk. Corp., Elmira, N. Y.

Replenishment of Motor Vehicle Parts—Allen End, Inc., Detroit

Cartridge Cases—Moore Enameling & Mfg. Co., West Lafayette, Ohio

Fin. Assy. Mortar Shell—Gabriel Co., Cleveland

Forces, Hemostatic, Straight, Kelly—Surgical Instrument Corp., New York

Facsimile Set—Times Facsimile Corp., New York

Radio Set—Sentinel Radio Corp., Evanston, Ill.

Signal Generator—Boonton Radio Corp., Boonton, N. J.

Shaft Assy.—Automatic Electric Sales, Chicago

Generator, Pulse—Hewlett-Packard Co., Palo Alto, Calif.

Radio Set—Barker & Williamson, Inc., Upper Darby, Pa.

Radiosonde Receptor—Fries Instrument Div. of Bendix Aviation Corp., Baltimore

Motor—Teletype Corp., Chicago

Transformers, Power—Westinghouse Electric Corp., New York

Lampholders—Manhattan Lighting Equip. Co., Inc., New York

Exciter, Amplidyne—General Electric Co., New York

Hoisting and Rotating Units and Spare Parts—M. L. Bayard & Co., Inc., Philadelphia

Pin, Firing—Milwaukee Stamping Co., Milwaukee

Primer, Assy.—Western Cartridge Co., Div. of Olin Industries, Inc., East Alton, Ill.

Screw, Drive—Central Screw Co., Chicago

Tail, Bomb—J. L. Clark Mfg. Co., Rockford, Ill.

Fuze, Bomb—Bayshore Industries, Inc., Elton, Md.

Indicator, Sub Assy.—Sperry-Gyroscope Co. Div., Great Neck, Long Island, N. Y.

Repair Parts for Electric Motors—Allis Chalmers Mfg. Co., Milwaukee

Repair Parts for Diesel Engines—American Bosch Corp., Springfield, Mass.

Repair Parts for Pumps—Morris Machine Wks., Baldwinsville, N. Y.

Filter Assys.—Purelator Products, Inc., Rabway, N. J.

Valves—Alco Valve Co., St. Louis

Repair Parts for Steam Boilers—Farell-Birmingham Co., Inc., Ansonia, Conn.

Repair Parts for High-Pressure Compressor—Hardie-Tynes Mfg. Co., Birmingham

Electric Motors—The Peerless Electric Co., Warren, Ohio

Repair Parts for Large Air Compressors and Steam Pumps—Ingersoll-Rand Co., Philadelphia

Trap and Spacer Assys., Rocket—Wald Industries, Inc., Huntingdon, Pa.

Generators—General Electric Co., Washington

Replenishment of Motor Vehicle Parts—Allen Industries, Inc., Detroit



With overnight trucking, products manufactured in New Jersey can be delivered to states which have 32 per cent of the nation's inhabitants. A 250-mile circle, centering on Trenton, the State capital, will encompass or intersect 12 states and the District of Columbia. This area is populated by approximately 14,000,000 families.

From a market analysis standpoint it is important to note that these people represent more than 70 billion dollars of effective buying income after the deduction of federal income taxes. It is the highest income market in the nation with an estimated income average of \$5,134 per family.



Write for your copy of the new digest about New Jersey, "An Industrialist's View of the Crossroads of the East." Box B, Public Service, 70 Park Place, Newark, N. J.

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Defense Contracts

Parts for Hand Grenade—The Fibre Forming Corp., Olean, N. Y.
Small Arms Components—Buffalo Arms, Inc., Buffalo
Ventilation Heaters—McIntyre Engineering Co., Inc., San Francisco
Centrifugal Fans—Stone Heating & Ventilating Co., Washington
Covered Lighters—Kyle and Co., Fresno, Calif.
Machines, Chucking—The National Acme Co., Cleveland
Boring and Drilling Machine—Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

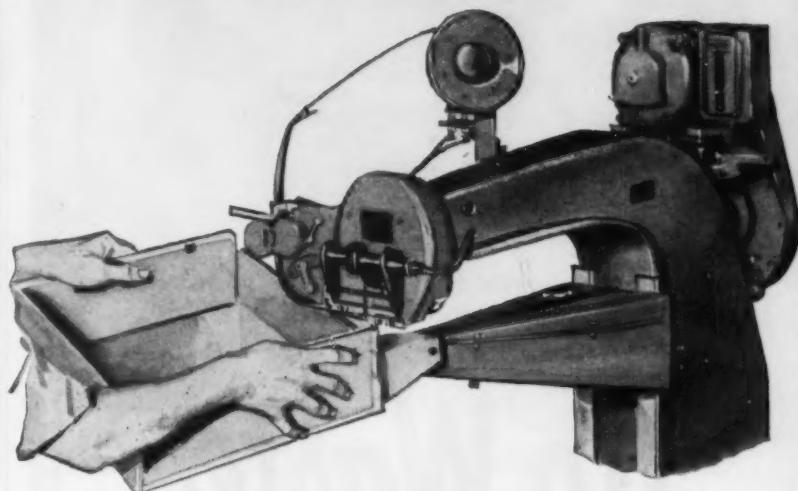
Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation no. or proposal, and opening date. (Invitations for Bids numbers are followed by "B," requests for proposals or quotations by "Q.")

Nut, jam, regular, steel, 1500 ea. (ENG-23-045-52-233B), Oct. 22.
Nut, machine, screw, steel, 75000 ea. (ENG-22-065-52-233B), Oct. 22.
Nut, regular, steel, 200000 ea. (ENG-23-065-52-233B), Oct. 22.
Nut, wing, brass, 5000 ea. (ENG-23-065-52-233B), Oct. 22.
Nut, wing, steel, (ENG-23-065-52-233B), Oct. 22.
Spearhead, flagstaff, 300 ea, 59B, Nov. 5.
Dog, indexing, 87672 ea, 52-59B, Oct. 23.
Knob, elevating, 52972 ea, 52-59B, Oct. 23.
Pinion, elevating, 47136 ea, 52-59B, Oct. 23.
Plate, butt, 66128 ea, 52-59B, Oct. 23.
Plunger extractor spring, 100288 ea, 52-59B, Oct. 23.
Ejector clip, 81520 ea, 52-60B, Oct. 23.
Spring, hammer, 76991 ea, 52-60B, Oct. 23.
Spring clip latch, 81520 ea, 52-60B, Oct. 24.
Spring, butt plate plunger, 75697 ea, 52-60B, Oct. 24.
Hydraulic lift parts, 52-102B, Nov. 5.
Maintenance parts, for Alpha Meter, 185 st, Q. Oct. 22.
Meter, test, analyzer, 34 ea, Q. Oct. 22.
Meter test, volt, ohm, milliammeter, 95 ea, Q. Oct. 22.
Outlet, convenience, 476 ea, Q. Oct. 22.
Lug, terminal, solder, 590 ea, Q. Oct. 22.
Transformer, 448 ea, Q. Oct. 22.
Connector, 110 ea, Q. Oct. 22.
Floodlight, 253 ea, Q. Oct. 22.
Transformer, 82 ea, Q. Oct. 22.
Lug, soldering, 1570 ea, Q. Oct. 22.
Charger, manual, 262 ea, 29875 Q. Nov. 7.
Bushing, 35 ea, 52-28B, Nov. 7.
Breechblock, 35 ea, 52-28B, Nov. 7.
Spindle, 35 ea, 52-28B, Nov. 7.
Chamber, evacuator, 1701 ea, 29882 Q. Nov. 5.
Muzzle brake, 3000 to 8000 ea, 29891 Q. Nov. 7.
Cylinders, pressure, 14100 ea, 52-188-C, Oct. 21.
Hammer, pneumatic, 1 1/8 by 2 in., 12 ea, (04-203-52-447), Oct. 23.
Sander, pneumatic, 37 ea, (04-203-52-447), Oct. 23.
Wrench, pneumatic, 14 ea, (04-203-52-447), Oct. 23.
Mower, lawn, 3 ea, LA-INF-66, Oct. 22.
Concrete breakers, 6 ea, (ECA-82-740-00-N112-1-2217), Oct. 26.
Vibrators, pneumatic, internal, 2 ea, (ECA-82-740-00-N112-1-2217), Oct. 26.
Concrete mixer, 1 ea, (ECA-82-740-00-N112-1-2217), Oct. 26.
Tractors, 1 ea, (ECA-82-740-00-N112-1-2217), Oct. 26.
Tar and bitumen heater, 2 ea, (ECA-82-740-00-N112-1-2217), Oct. 26.
Seals, self locking metal, 42-52-C, Oct. 23.
Tractor, 1 ea, 58-52-C, Oct. 23.
Compressor, air, 16 ea, D-31, Oct. 23.
Ladder shoes, 11 items, 1570, Oct. 19.
Microcontrols and barometer, 2 items, 1571, Oct. 19.

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Will Exhibit for Small Plants

Approximately 100 prime military contractors in the Michigan-Ohio area are expected to display their products at an armed forces exhibit for subcontractors in Detroit from Oct. 30 to Nov. 2.

U. S. Dept. of Commerce, Detroit Board of Commerce, and Michigan Dept. of Economic Development are among the agencies co-sponsoring the exhibit, which follows a series of similar shows staged in leading cities by armed forces regional councils this year.

It is anticipated that about 10,000 prospective subcontractors will be on hand to meet engineering and production representatives of large munitions producers. The latter will be prepared to discuss tooling, tolerances, deliveries, and other data pertinent to the components which are needed to complete military contracts.

Bendix Plans Contracts Show

Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, N. J., will start a subcontracting exhibit in Newark, N. J., Oct. 22.

About 65 individual parts—pins, gears, instruments parts, shafts, etc.—will be shown. Total volume required on them is about \$250,000 a month. Shops with turning, drilling, milling and grinding facilities should be interested.

The show will be held in the Eastern Air Force Procurement District office at 218 Market St., starting at 9:30 a.m. Production run on each part will be listed.

Jet Engine Order Placed by Navy

Navy orders for jet engines totalling several hundred million dollars have been placed with Aviation Gas Turbine Div., Westinghouse Electric Corp. The orders represent the largest equipment purchase for any category of machinery in the company's history.

Several models of jets are involved, all for use in latest model Navy combat planes. Engines will be built at several plants.

Subcontracting

Defense Work Show in Denver

Defense prime contractors in the Rocky Mountain states will show their wares and meet prospective subcontractors at a joint Armed Forces exhibit in Denver, Nov. 13-15.

Firms which can manufacture components or provide services for holders of rearmament contracts are being invited to send representatives to the display. There they will meet engineering, production, and contracting officials of major firms and examine blue prints and specifications of components or end items needed to complete defense orders.

Joint Effort — Cooperating in presenting the exhibit are the Rocky Mountain Armed Forces Regional Council, the Colorado Development Council, U. S. Dept. of Commerce, state Chambers of Commerce, and the governors' Small Business Committees of four states.

Previous exhibits for subcontractors have been staged by Regional Councils in approximately 10 cities from Boston to Los Angeles, and from Ft. Worth to Cleveland. These councils coordinate military procurement and construction activities.

Heads Small Plants Agency

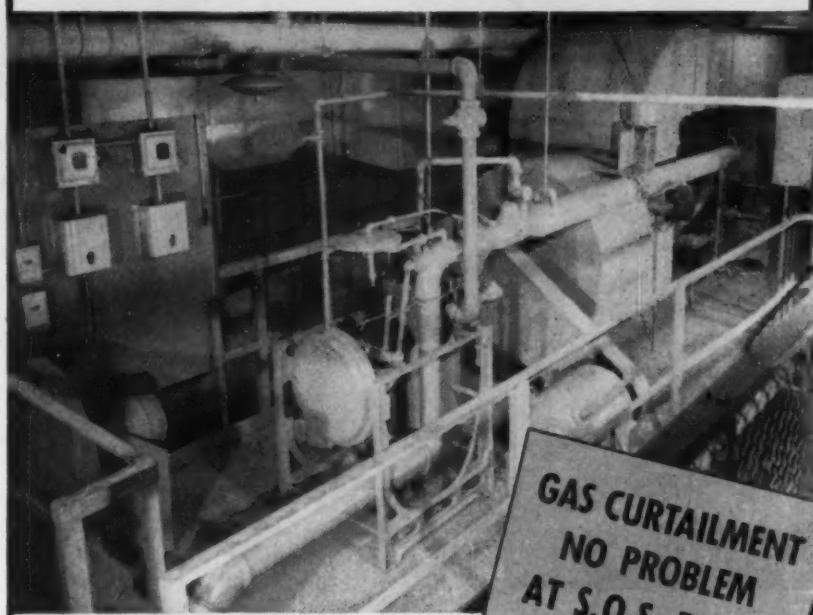
Telford Taylor, a New York City attorney and former Federal Communications Commission counsel, has been named by President Truman to head the new Small Defense Plants Administration.

SDPA was created by Congress 3 months ago as a device for aiding participation by small firms in the mobilization program. It has full authority to approve both working-capital and expansion loans to war contract holders.

New Army Truck in Production

Production has started on GM's new 6 x 6 tactical military truck, M-135. First vehicle rolled off the assembly line less than 10 months after GMC Truck & Coach Div. had been given a letter contract to produce the new truck.

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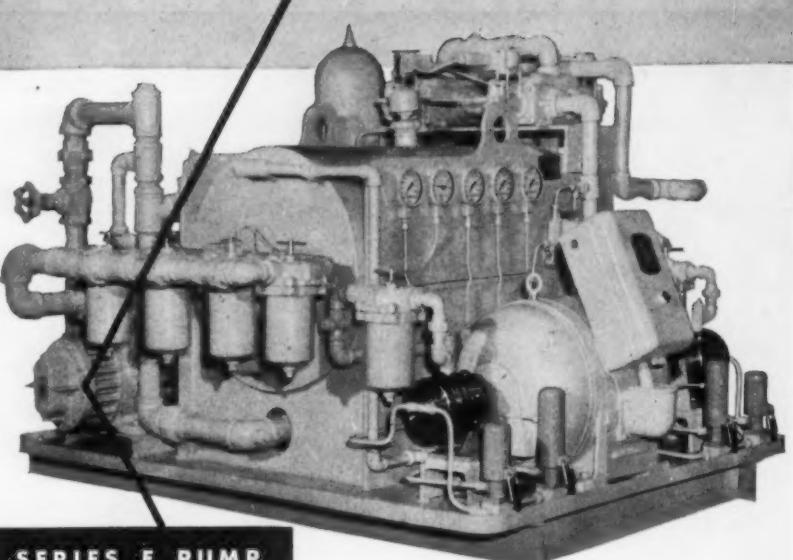
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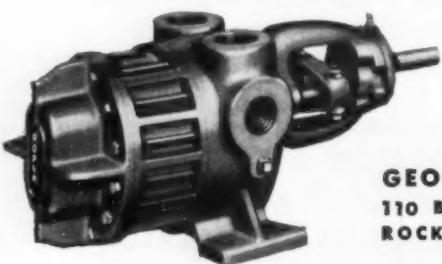


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Subcontracting

Small Firms Get More War Work

Increasingly larger shares of all Army procurement contracts are going to smaller firms.

In the fiscal year ended June 30, the Army says, 75 pct of its contracts were awarded to small firms. More important, from the producer's standpoint, these awards represented 30 pct of the dollar value of Army contracts for fiscal 1951.

Total of 1,358,869 contracts were let by the Army in that period. Of these, small business received 1,029,805, valued at more than \$4,300,000,000. These figures do not include the thousands of subcontracts passed on to small firms by prime contractors.

Need More Subcontractors—In one study of a group of prime contract awards involving about \$900,000,000, the Army found that 42 pct of the amount accrued to small business through subcontracts. Another group of prime contracts was immediately followed up by 9700 subcontracts.

Production of the light tank known as the Walker Bulldog requires 2000 suppliers, representing 22 states, to furnish materials and parts for construction. Army expects to augment its list of subcontractors, as do the other military services, through the national series of jointly-sponsored subcontractor exhibits.

Signs \$30 Million Navy Contract

Northern Ordnance, Inc., operating a Navy-owned plant at Fridley, Minn., has signed a \$30 million contract to build a new type 5-in. gun for the Navy. Production will begin immediately.

Addition of this contract brings to \$53 million the money value of Navy orders undertaken by Northern Ordnance.

The firm will reactivate certain facilities at the plant, which have been maintained on a standby basis since the end of World War II. Machine tools must be installed, and the number of employees will be doubled.

This Week in Washington

Find Flaws in Production Planning

Steel industry retorts with own list of suggestions to improve production planning and CMP . . . This analysis offers remedies . . . Covers many planning phases—By G. H. Baker.

Top mobilization officials this week called off—temporarily—their needling campaign against steel and metalworking management. Industry-government cooperation, they now admit sheepishly, is a 2-way street. Besides, industry leaders have turned the tables with a list of pointblank suggestions to improve production planning that must not be ignored.

Management representatives are painfully aware that they've been ridden unmercifully by federal planners in recent months. Much of this, they point out, has been entirely unjustified (example: government ranting about lack of productive capacity in the face of deep cuts of structural allotments to build this capacity).

Food for Thought—Mobilization Director Charles E. Wilson and his aides now on the receiving end have something to chew over—a terse, crackling 9-page report from steel management pinpointing current weaknesses in government production planning. It is backed up with concrete proposals for remedying these faults.

Highlights of the production report—prepared by Ben Fairless, U. S. Steel; Eugene Grace, Bethlehem; E. L. Ryerson, Inland; John Marshall, Granite City, and W. H. Colvin, Crucible—follow:

Prices: Cost increases since last December have already outstripped price advances, as a result of increases in the cost of goods and services purchased by industry. It is, therefore, highly important that the future adjustments in selling prices fully reflect all elements of cost, including

goods and services purchased, as well as any wage and salary increases.

CMP: It is impossible to determine the degree of imbalance between supply and demand when stated requirements are unrealistic. We recommend that there be set up within DPA a staff to examine status of construction projects of each claimant agency. Purpose would be to determine whether requirements are realistic as to *quantity* and *timing*. Construction should first secure the approval of this staff *before* the stated requirements of structural shapes are presented to the DPA Requirements Committee.

Allotment Applications: Application should require a statement of actual usage, in tons of steel, during the preceding quarter, as well as total inventory in tons at the close of the previous month.



Military Contracts: Vigorous steps should be taken to end the military's practice of approving delivery of steel to contractors far in advance of actual need.

Order Acceptance: Present 10 pct reservation until 15 days prior to lead time is unnecessary and confusing. Producers must now accept military and atomic energy orders while there is open space. With all other CMP orders having equal status, the reservation serves no useful purpose and creates a false condition of inadequate space at the mills.

Spread Military Orders: It is recommended that large programs (such as landing mats, chemical warfare bombs, tank armor plate, etc.) be spread equitably among the producers by the use of production directives in a manner similar to that which is now used for shell steel.

Over-Allotments: The Requirements Committee should restrict its allotment of steel to a maximum of 110 pct of supply.

New Certifications: Present requirements of certification of orders by consumers of steel be revised to require the buyer to state that the order is within the amount allotted him for that quarter, and that no duplicate orders have been placed.

Inform Industry: It is important that the industry be kept acquainted, through the Steel Products Advisory Committee, with the government's production objectives. Example: Give a broad estimate of the rate of increase in the machine tool program.

Conversion: Steel Products Advisory Committee should start a

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THE IRON AGE

study of problems related to conversion steel.

Scrap: OPS should act promptly on the proposal to set a single price for the five grades of open-hearth steel scrap. Appoint an industry man to accelerate the movement of government-owned scrap.

Tax Writeoffs: Certificates of necessity should be granted promptly wherever connected with soundly-conceived raw-material expansion programs. Special attention should be given to steel growth projects.

Expansion Materials: Materials for expansion must be delivered in time in order that plants may be completed on schedule.

Labor: It is of the utmost importance that government, management and labor exert their best efforts to prevent work stoppages and slowdowns.

Personnel: Each of the five companies represented agree to lend SPA's Iron and Steel Div. competent, trained men.

Another Aluminum Producer?

Possibility that an integrated aluminum mill may be built in Arkansas was raised at the White House last week.

Gov. Sidney S. McMath, of Arkansas, conferred with President Truman about ways of obtaining an allocation of 64,000 tons of Arkansas bauxite for an integrated plant to be operated by the Spartan Aircraft Co.

The White House "is interested," McMath stated.

Renegotiation Deadline Extended

Firms having fiscal years ending prior to Nov. 30 and which hold government contracts subject to renegotiation now have until Mar. 1, 1952, to file their financial statements with the U. S. Renegotiation Board.

Extension of the deadline was granted by Board Chairman John T. Koehler.

CMP CUTS: Safety's in War Work

Washington paints desperate picture for some civilian industry . . . Ingenuity needed . . . Switch to war work is a must . . . Wilson sees steel production increase—By R. M. Stroupe.

Basic significance of first quarter CMP allocations (see p. 44) lies in the government's faith in each producer's ingenuity and his determination to stay in business in 1952 if he is producing non-defense items.

Manufacturers of what Defense Production Administrator Manly Fleischmann calls "non-essential" goods may have to get along for a time on as little as 15 pct of the copper and aluminum they used in pre-crisis years. Speaking at joint hearings of four congressional committees, Fleischmann forecast—and Defense Mobilizer Charles E. Wilson concurred—that some firms may not survive the first 6 months of next year.

Must Subcontract—An alternative will be for these companies to turn as rapidly as possible to military production. Wilson said every effort will be made to assist such firms in obtaining a share of military production funds through such channels as subcontracting.

He told congressmen that the job of contract distribution to small businessmen has been "amazing" in its effectiveness, and spoke optimistically of small firms' chances of staying in operation. By the third quarter of 1952, he said, there should be a better balance in production of military and civilian goods.

Steel Output Rise—Wilson also went on record, reluctantly, as predicting a rise in steel supply of about 1 million tons in the first quarter. He based his estimate in part, he said, on the expectation that two large new blast furnaces will begin producing early in the year.

Later, however, it was pointed out that figures released by Defense Production Administration made it appear that in the first 3 months of 1952 steel supplies will drop by about 200,000 tons, as compared to the 21,336,000 said to be available in the present quarter. According to a DPA spokesman, his agency's figures are based on information received from steel manufacturers.

Sen. Homer Capehart, R., Ind., brought up the question of rationing end-products, such as automobiles, as a conceivable step after materials are more tightly distributed. Wilson replied that he could not conceive of a need for rationing in the foreseeable future. He admitted, though, that a continuing scarce-metals situation for another 2 years might bring on a requirement for rationing.

Capitol Exchange

Sen. Fulbright was determined to get into the record Mobilizer Wilson's statement that the U. S. contemplates no expenditures for augmenting Canadian aluminum production. Here is gist of the interchange:

Fulbright—Who gets Canadian aluminum after it has been allocated for U. S. consumption? Is there any way you (Wilson) can control distribution of the metal to U. S. manufacturers?

Wilson—Contracts for Canadian aluminum are taken into consideration when allocations of U. S. aluminum are being made, so that no excessive amount will go to any one user.

Fulbright—That's just what I wanted you to say — that there's no actual way to direct the flow of Canadian aluminum into this country, and I hope our government will not make the mistake of getting into the business of backing Canadian production again. Wilson assured him there is no such plan.

Industrial Briefs

Chase Celebration—CHASE BRASS & COPPER CO., Waterbury, Conn., is celebrating the 75th anniversary of the founding of the company. A recent edition of the *Chase News* shows some interesting comparisons of the old and the new.

Housing Boom—William J. Levitt has bought 2400 acres on state highway 13 between Morrisville and Bristol, Pa., and is moving his construction crews into Bucks County to start work on a self-contained garden community that will house 16,000 families.

Production Started—Production in RAYBESTOS - MANHATTAN's new Wabash Div. has started in a 70,000 sq ft plant, newly constructed to manufacture sintered metal products for the military defense program.

In Training—ILLINOIS INSTITUTE OF TECHNOLOGY has received a contract to train 90 Chicago Ordnance District workers in the fundamentals of precision inspection. Samuel E. Rusinoff, associate professor of mechanical engineering, is in charge of the course.

In Operation—The largest single-shaft turbo-generator ever built for industrial power production is now in operation at U. S. STEEL CO.'s South Works, Chicago. Steam for the generator is provided by a new boiler with a capacity of 650,000 lb per hr. It operates at 900 lb, 900°F, at the superheater outlet and is equipped with water-cooled walls.

"Highway Muddle"—GENERAL MOTORS CORP. has inaugurated a program featuring a movie, "Let's Get Out of the Muddle," and an accompanying booklet, which spells out graphically the rapidly deteriorating condition of American highways and makes recommendations for the solution of the problem.

Sulphur Recovery Plant—To alleviate the critical shortage of sulfur and its most important compound, sulfuric acid, SHELL CHEMICAL CORP. will add to its Houston operations a unit for recovering sulfur from waste refinery gases. Output of the new unit will be sold for conversion to sulfuric acid.

American Acquisition—AMERICAN MACHINE & FOUNDRY CO. has purchased the complete "Monarch" woodworking machinery line of American Saw Mill Machinery Co., Hackettstown, N. J.

Loan Granted—EKCO PRODUCTS CO., Chicago, announces the completion of a \$4 million 20-year loan with the Prudential Insurance Co. of America. The sum will be added to the current assets of the company and will be used for general operating purposes.

Sales-Service Center—Ground was recently broken for a new building to be erected by VEEDER-ROOT INC., between Greenville, S. C., and Spartanburg, to serve their southern and southeastern territory.

Contract Entered Into—A contract to construct a \$1,000,000 plant to produce ferromanganese, ferrosilicon and other alloys has been awarded H. K. FERGUSON CO., by the newly-formed Tenn-Tex Alloy & Chemical Corp., in Houston.

Record Cinched—S. S. *Wilfred Sykes*, giant ore boat of the INLAND STEEL CO. fleet, has cinched a Great Lakes shipping record for its first full season of operations. The vessel has completed 33 trips between Chicago and Lake Superior ports. Its average load a trip has been 19,876 gross tons.

Birmingham Branch—A new factory branch of TRAILMOBILE INC. has been established in Birmingham. Trailmobile has been operating its Birmingham sales actively as a sub-branch under Atlanta.

Overseas Subsidiary—Canadian Aviation Electronics, Ltd., has formed an overseas subsidiary company, CAE (OVERSEAS), LTD., to be located at 41 Kingsway, London.

Award Presented—The first Palladium Medal Award of the ELECTRO-CHEMICAL SOCIETY was presented to Dr. Carl Wagner, visiting professor of metallurgy at M.I.T.

Navy Project—The U. S. Navy plans to build a guided missile plant costing \$25 million at Bristol, Tenn. Type of missile to be manufactured was not disclosed. The Navy is now acquiring land for the project, which will be built by SPERRY & CO.

Generating Units—Plans for a \$3 million 210,000 kw steam generating plant to be built near Cleveland, Miss., have been announced by the MISSISSIPPI POWER & LIGHT CO. Two generating units of 105,000 kw capacity each will be installed.

UMA Approves Loans—UNITED MINE WORKERS OF AMERICA, Welfare and Retirement Fund has approved loans to three non-profit charitable corporations for the construction of hospitals over a 3-year period in ten coal mining communities. The loans go to Memorial Hospital Assns. of Kentucky, West Virginia and Virginia.

Jet Parts Plant—A new \$7 million plant for the production of jet engine parts was dedicated by SOLAR AIRCRAFT CO. in Des Moines early this week. Called the Wakonda plant, it will produce J-47 jet engine parts to fill an \$8 million contract awarded Solar by the Packard Motor Car Co.

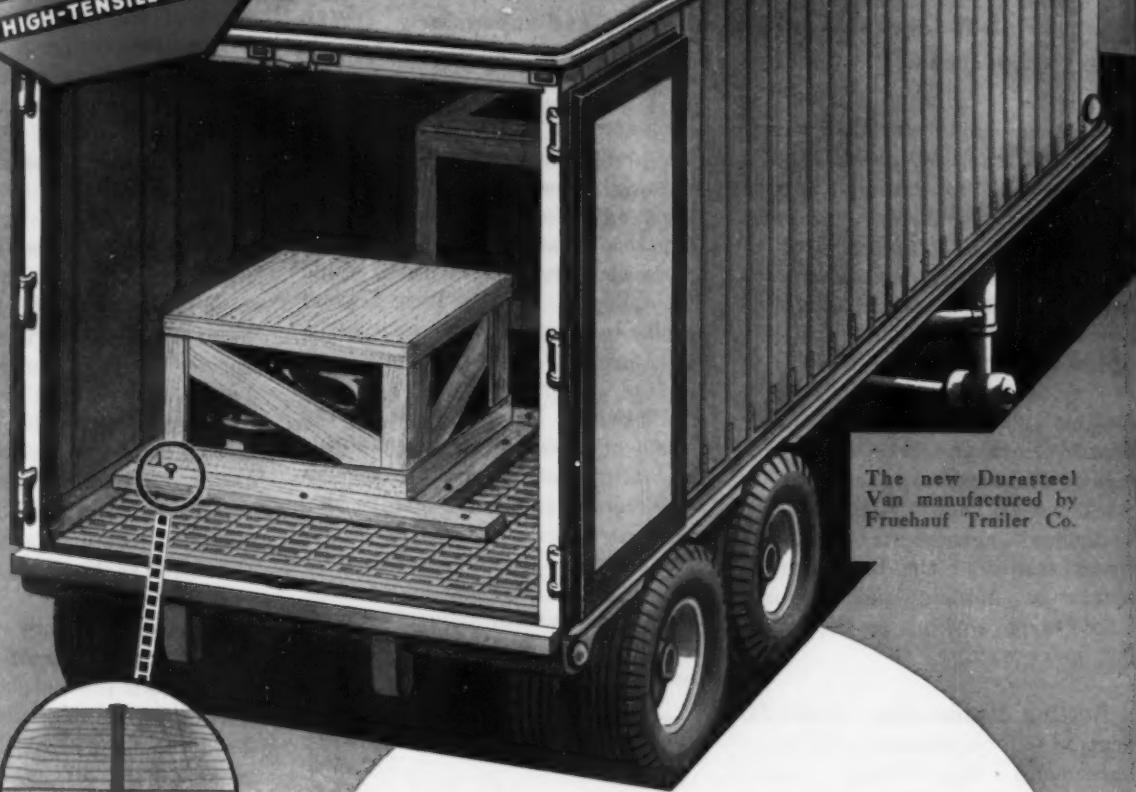
Expansion Program—CANADIAN WESTINGHOUSE CO., LTD., in connection with its \$10 million expansion program set for this year, will erect two new plant buildings at Hamilton, Ont., for the manufacture of electrical equipment for the armed forces.



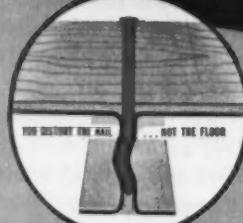
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The Automotive Assembly Line

Reuther Springs Borg-Warner Strike

Union and company butt heads over industrywide bargaining . . . B-W takes stand it's unnecessary and unpopular . . . WSB gets case . . . Plymouth patents expire—By W. G. Patton.

Another chapter in Walter Reuther's untiring efforts to obtain industrywide bargaining in the auto industry is being written at Borg-Warner. The union's effort to accomplish its purpose was so well organized that a strike hit ten of the company's 12 plants a day ahead of schedule.

The first walkout closed three Detroit plants — Detroit Gear, Morse Chain and Long Mfg. Advance walkouts also occurred at Rockford, Ill., and Memphis, Tenn. Individual agreements were recently signed at the Borg-Warner plants at Muncie and Auburn. These were working as the strike got under way.

Butting Heads—The UAW-CIO demand is for a company-wide wage agreement. Borg-Warner insists that each of its divisions has full authority to negotiate with the UAW-CIO. The importance of the strike is indicated by the fact that the issue was turned over to the Wage Stabilization Board immediately by order of President Truman.

Roy C. Ingersoll, Borg-Warner president, has argued that a national agreement could not possibly benefit union members. Ingersoll insisted further that there is a strong employee feeling against any proposed national agreement.

B-W Resists—The union's desire to get a company-wide contract is understandable. Such contracts simplify negotiations. They tend to knock down any wage differentials between different cities. This has always been a Reuther ambition.

Borg-Warner is one of very few

companies in the industry—if not the only firm—to insist on bargaining at the local level. The company says further that there are practical reasons why a company-wide agreement in their case would be unsound. While a Borg-Warner strike settlement may come early, it can hardly come too soon.

Plymouth Patents—One of the basic patents on Plymouth's "Floating Power" mounting for a passenger car engine expire this year. It will be interesting to see if a scramble develops in the automobile industry to adopt this highly successful type of mounting for a 6-cylinder passenger car engine.



FEAT OF STRENGTH: GMC Elevator-Bed truck can lift heavy equipment as high as 12 ft. Here it loads jeep onto Air Force cargo planes during maneuvers near Fort Bragg, N. C.

Aluminum Radiators—The most intensively active research program in the automobile industry today is directed at the development of aluminum radiators.

Considerable progress has been made. Aluminum radiators are being tested in the field. There is an excellent possibility of volume production in the industry in less than 2 years.

Service Problems—Manufacturing problems, it is reported, are not as difficult as providing protection against corrosion. The question of service in the field may turn out to be the most difficult problem of all.

Several automobile companies have tried copper-clad radiator tanks. Up to the present time, this approach to the radiator-copper problem has not been successful. Corrosion is the principal objection.

Aircraft Engines—Chevrolet Motor Div. will build a million sq ft aviation engine plant at Flint. The new facilities will be used to produce the 2700 hp Wright Cyclone R-3350-26W and the 3500 hp Wright Turbo-Compound R-3350-30W, according to T. H. Keating, Chevrolet general manager.

Chevrolet has previously announced a million sq ft expansion for the Buffalo area. The Flint and Buffalo expansion programs are scheduled for completion within a year. When Chevrolet built Pratt and Whitney engines during World War II about one-third of the parts were made by Chevrolet. More than twice as many parts were supplied by outside firms under subcontracts.

8 Million Cars—It's now official. Motor vehicle production passed the 8 million mark during 1950, totaling 8,003,000 units. The official figures are included in the 31st edition of *Automobile Facts and Figures*, released last week by the Automobile Manufacturers Assn.

Turn Page

THE IRON AGE

CUT COSTS: Push Materials Handling

Ford official stresses need for adequate training centers . . . Bill for materials handling is 25¢ out of production dollar . . . Cites several cost-saving methods Ford installed.

A job that won't wait is the establishment of adequate training centers in materials handling, Del S. Harder, vice-president in charge of manufacturing, Ford Motor Co., told several hundred industrialists at a meeting in Detroit's Rackham Educational Bldg. last week. Harder also announced the establishment of a research and training center in materials handling, packaging, warehousing and traffic at Detroit's Wayne University.

Harder said 25¢ out of every dollar paid for production labor goes for handling materials. He estimated \$9 billion of industry's annual payroll is going for the labor of handling materials around shops and factories.

Progress Pays—In his talk, Harder cited several recent examples of materials handling at Ford. Foundry scrap was formerly handled by laborers, wheelbarrows and overhead crane dumping, he said. It took 112 laborers, 100 wheelbarrows and 12 cranes. By using industrial power trucks and special hoppers, Ford now does the same job with 36 people. The necessary equipment was paid for in 80 days.

In its gear and axle plant, rough castings and forgings used to be thrown off trucks into large wooden bins. Handlers placed the pieces on conveyors. By using tub containers and loading directly from trucks, Ford is doing all subsequent handling with industrial fork trucks and saving approximately \$50,000 a year.

Savings at Rouge—Chassis springs made at the Rouge used to be individually picked up at the end of the line and put on a conveyor. They were individually taken off the conveyor and loaded

into the cars. Now, Ford bands groups of springs on expendable skids at the end of the line and hauls the skids to the freight cars with industrial power trucks. The saving is \$56,000 per year.

Harder emphasized that Ford works closely with traffic people and common carriers. The Ford program, he emphasized, goes beyond unitized shipping. Carriers have been very cooperative in furnishing cars equipped with racks and fixtures designed to hold the specific parts, he said.

Loading Technique—The Ford executive also said that automatic dock facilities for truck loading are saving time and money for

Ford. By using roller-equipped docks and equipped vans, Ford is able to load or unload 35,000 lb of material from a van in 10 minutes. It used to take an hour and a half by the old loose-loading method.

Ford is spending over a million dollars a year for material handling, packaging and warehousing equipment and the company thinks it is well worth it, Harder concluded.

GM Output Registers Drop

General Motors car and truck production totaled 199,910 during September compared with 245,777 vehicles produced during the same month last year. For the year to date, GM production in U. S. plants was 2,252,307 compared with 2,767,337 a year ago.

Passenger car output is lagging 22 pct below last year. The number of trucks and coaches built, however, is within 2 pct of the total for the first 9 months of 1950.

THE BULL OF THE WOODS

By J. R. Williams





Only Individual in the U. S. A. with No Interest in the Steel Situation

There's no point in beating around the bush.

You know the steel picture as well as we do.

In these rearming times, our mills are producing every ton of steel to capacity, yet we still can't fill all the requirements of our regular customers or go out looking for new business.

But of one thing you can be sure. The steel

we are making today is as fine as strict metallurgical control can make it. And we can and will continue to be completely honest about our ability to deliver. When we make a commitment, you can rely on shipment as and when promised, in the specifications and with the quality you have learned to expect from us.



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WISCONSIN STEEL

West Coast Report

Steel Plant Growth on Schedule

Slow equipment deliveries offset . . . Some new plants near completion . . . Hope grows for Nevada blast furnace . . . Pig iron market eases . . . Buy three ore ships—By R. T. Reinhardt.

Expansions of steelmaking and finishing facilities in the West are moving along almost on schedule in spite of minor upsets in planned equipment delivery.

Seidelhuber Steel Rolling Mills now expects to produce its first ingots in its electric furnace in Seattle, Wash., by Nov. 15—about 2 months behind initial estimates. Furnace is in place, building about completed and scrap is to be received this month.

Anthony L. Ascik, at one time a melter in Poland and more recently in England, Canada and Bridgeville, Pa., will be in charge of melting operations. Frank Wood, formerly with Kaiser Aluminum & Chemical Corp. and now engineer in charge of Seidelhuber's proposed rolling mill, is in the East purchasing mill equipment.

Forging quality steel is first on the schedule and will be sold in ingot form until rolling facilities are installed next year.

Columbia on Schedule—Columbia Steel Co. expects to have its new 4-stand cold reduction mill working next month and its enlarged tinplate facilities and continuous galvanizing line operating before the end of the second quarter of 1952.

Sheet and tinplate capacity will then be about 650,000 tons per year—a 100 pct increase.

Still no announcement about what Columbia will do with the Alcoa plant in Los Angeles it purchased in 1948 for the purpose of installing a cold reduction mill.

Kaiser Due in June—Kaiser

Steel Corp.'s new cold reduction mill will be in production in June, 1952, and the tinplate mill shortly thereafter turning out 200,000 tons per year.

Financing of the proposed third blast furnace is being studied following a favorable economic survey made by Coverdale and Colpitts. Some changes involving rolling facilities included in the original application for a certificate of necessity (which was granted) have been made, but the blast furnace and coking facilities remain.

Judson Plans—Judson Steel Corp. at Emeryville, Calif., expects to decide within a month whether to proceed with plans to double ingot capacity and increase product range to include 12-in.

merchant mill sizes. Production now is confined to reinforcing bars and small rounds.

Judson has three 30-ton open-hearths with a capacity of 76,500 tons per year. Under consideration is a switch to electric furnace operation.

More Hopes—Increasing activity in mining Nevada iron ore for shipment to Japan continues to stimulate thinking about a blast furnace in that state.

J. R. Simplot, western industrialist who recently started ore shipments to Japan, is reported as saying that such a development is "possible." So far as known, no one has come up with money for such proposals.

Ore Ships Bought—Joshua Hendy Corp. of San Francisco and Los Angeles recently purchased three C-4 cargo vessels from Luckenbach Steamship Co. for the announced purpose of shipping iron ore and other bulk cargoes across the Pacific.

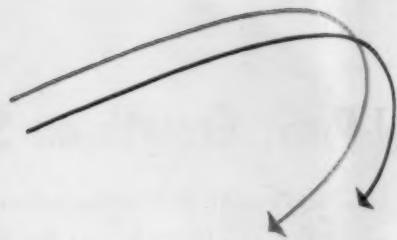
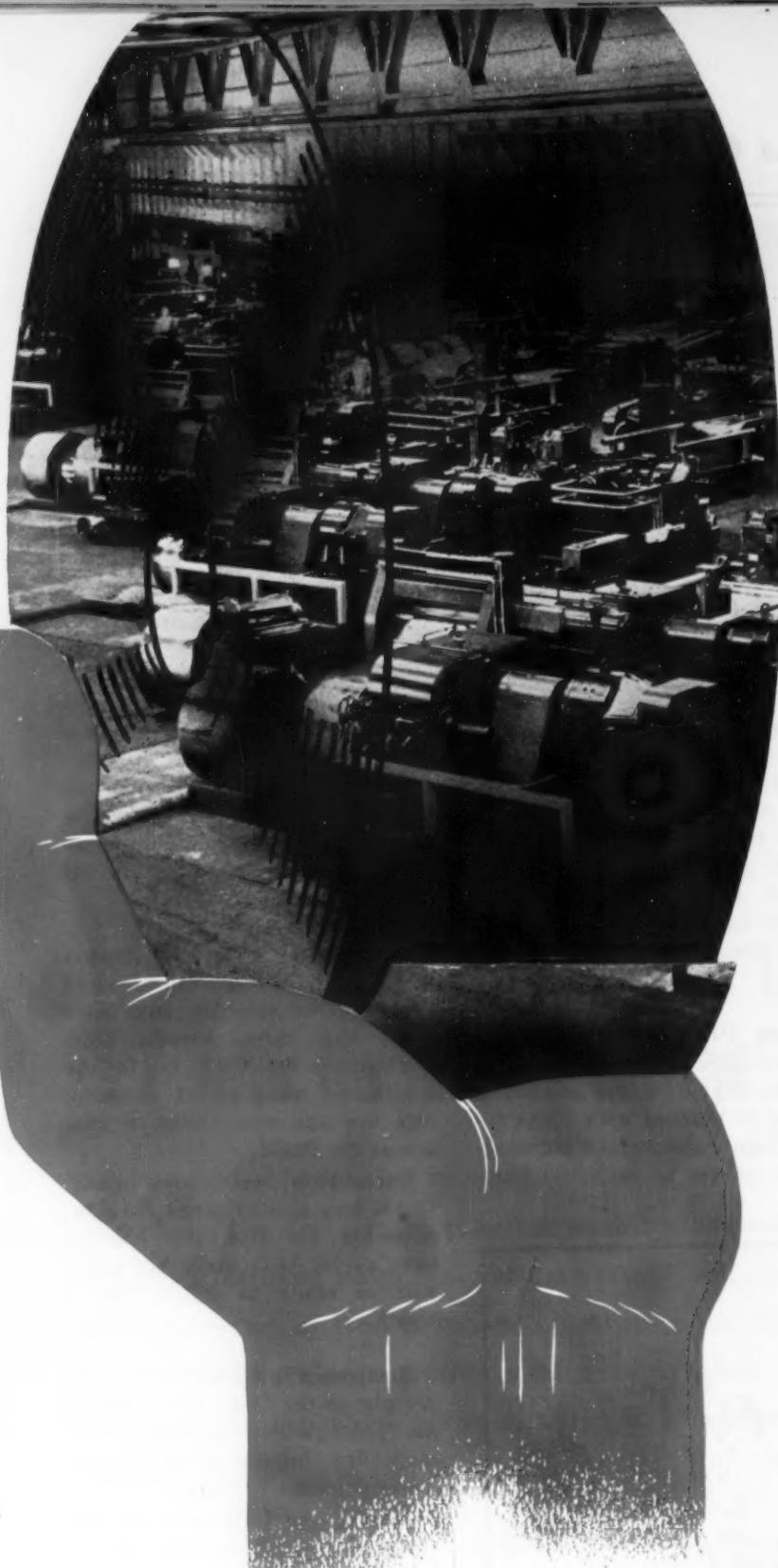
Each ship can carry about 13,000 long tons of cargo. No commitments for iron ore hauling have as yet been made but ships will be ready to sail within a month.

Homeless Pig—Once more foundry pig on the Coast has eased to the point where foreign metal can't find buyers much if any above domestic ceilings.

German and Dutch pig recently offered at \$85 per ton in Los Angeles finally went for \$66. A shipload of pig brought to that city from Germany eventually was routed on to Australia where buyers will probably wind up paying about \$90 per ton.

An important factor in drop in local pig demand is the curtailment of building starts. The heat is off soil pipe and consequently foundries are slowing down.





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Machine Tool High Spots

Output Grows Under Handicaps

Boom or bust economy plague of industry . . . Order-shipment ratio now at peak . . . Dollar values deceptive . . . New cost adjustment method . . . Loans easier—By G. F. Elwers.

Production and shipment figures released monthly by National Machine Tool Builders' Assn. demonstrate graphically the plight of machine tool builders today. New order index for the second quarter of 1951 stood at 522.0, the highest it has ever been except for part of 1942. Shipment index at end of 1951's second quarter was 172.1, a respectable figure but lower than no less than 13 quarterly periods during World War II. NMTBA index figures are based on the average of 1945, 1946, and 1947 as 100.

Prior to World War II, the industry was in one of its depressed periods. New order index for first quarter of 1939 was 52.8, as low as it dropped in the much-publicized industry depression prior to Korea. Shipments then were 41.5, half those of the lowest quarter since World War II.

War Boom—But when war began in 1939, there was an immediate demand for machines, first for European war plants and later for machines for the plants in the U. S. Order index rose to nearly 200 by the end of 1939, to 274.5 in 1940, and was above 300 when U. S. entered the war in 1941. Shipments rose to 76.7 in 1939, 166.5 in 1940, and 267 in 1941. By this time the United States' own defense buildup had begun, with a solid foundation established by expansion of machine tool production for European orders.

In 1949 and 1950, quarterly new order index for machine tools fell as low as 52.4, and shipments were as low as 61.4. There was practically no buildup prior to Korea. Industry was looking the other way when machine tool salesmen called,

and military procurement was on the downgrade. Suddenly the situation reversed. New orders doubled in the third quarter of 1950, and almost doubled again in the next two quarters.

Production Rise—Despite handicaps, the industry did a remarkable job of upping production, going from 115.9 in shipments by the end of 1950 to 132.3 and then 172.1 in the first two quarters of 1951. Still, never in the industry's recent history, and probably never at all, has the shipment index stood so low in relation to volume of new orders.

A note of caution is advisable in interpreting the above figures. It must be remembered that they are based on dollar values, which have declined since 1939. So index figure

comparisons between years are not so significant in terms of numbers of machines as they might seem. However, comparisons between a year's orders and shipments for different years are, being ratios, valid regardless of dollar fluctuations.

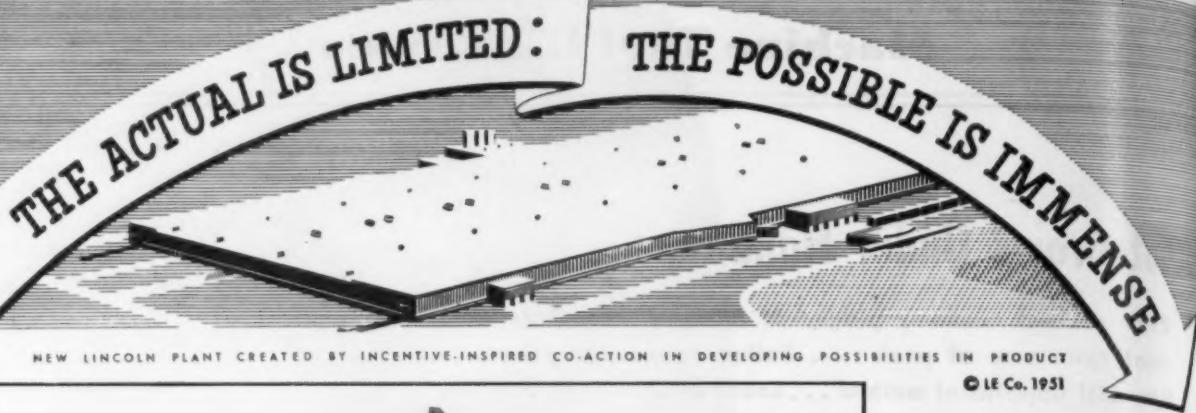
New Costs Method—An alternate method of computing materials cost adjustments under Ceiling Price Reg. 30 has gone into effect, and promises to help in reducing the load of paperwork and computation saddling machine tool builders. Under Amend. 17 to CPR 30, computations are required only for those materials accounting for 75 pct of all materials in a plant or for the commodity, product line, or category.

No manufacturer need use the new alternate method. Those who do must file a request with Office of Price Stabilization when filing Form 8. Materials cost adjustments computed under Amend. 17 may be put into effect without waiting for approval from OPS officials.

Loans Easier—Also from Washington comes further news about obtaining loans to finance machine tool production. Jess Larsen, General Services Administrator, is emphasizing that a manufacturer does not have to go to any government agency to obtain V-loans.

Larsen says applicants should go to their own banks and apply for the needed funds. The banks may, if they so desire, then go to the Federal Reserve Bank for a government guarantee contract. Any machine tool manufacturer or subcontractor whose production is substantially earmarked for national defense is eligible for a guaranteed loan. This includes practically all machine tool builders, few of whom have more than 20 to 30 pct civilian business remaining on their order boards. This doesn't apply to all their subcontractors.





NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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DESIGN IN STEEL IMPROVES APPEARANCE

... lowers cost 15%

UTILIZING the economies of welded steel has cut the cost of this machine base by 15%, while achieving better sales appeal through its clean, modern appearance.

Following the features of the original base, as shown in Figure 1, the first design involved 13 separate components and required 205 inches of welding (Fig. 3). However, by taking full advantage of opportunities for simplifying details while increasing strength and rigidity, the final design, (Fig. 4) involved only 7 components and welding was reduced 40%.

Machining costs are cut sharply since welded components are formed close to finished dimensions. Changes in design for special needs of customers can now be accomplished without need for alterations in patterns.



Fig. 4—Present Design has rigid box-type construction. Needs less material than Figure 3. Designers and Fabricators: The Boiler Repair and Welding Shop, Inc., Bridgeport, Connecticut.

Fig. 3—First Weldesign in Steel follows appearance of original construction. Saves on metal because steel is stronger than iron.

WELDED DESIGN ALWAYS IMPROVES PRODUCT AND LOWERS COST

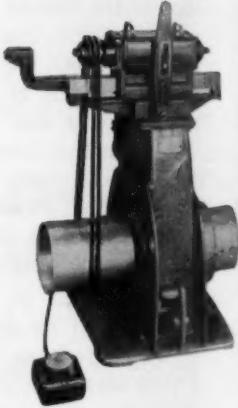


Fig. 1—Original Design of wire straightening machine for the A. H. Nilson Co., Bridgeport, Connecticut. Required considerable machining, cleaning and finishing prior to painting.



Fig. 2—Welded Design costs 15% less, improved appearance . . . better sales appeal. Tests show base has greater rigidity than in original construction.

HERE'S PROOF

Machine Design Sheets are available to designers and engineers. Simply write on your letterhead to Dept. 511,

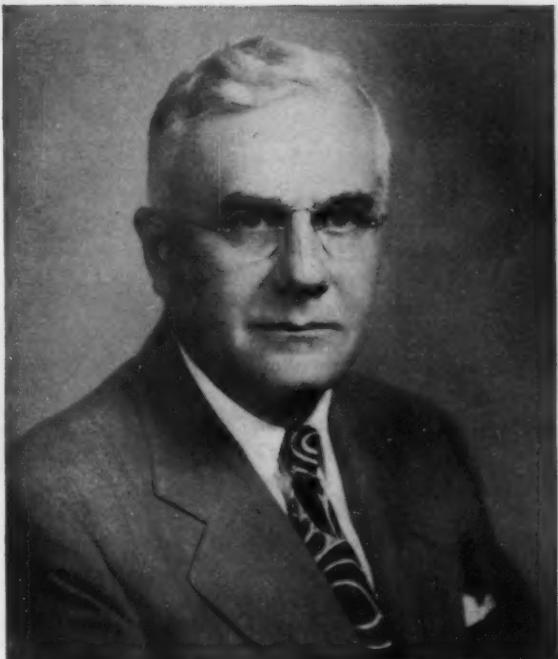
THE LINCOLN ELECTRIC COMPANY
CLEVELAND 17, OHIO

The Iron Age

SALUTES

Thomas D. Jolly

More people understand the work of the American Standards Assn. because of Tom Jolly's leadership.



WHEN Tom Jolly ends his second term as president of the American Standards Assn. this month, more people in and out of industry will know what the organization stands for than ever before.

Tom believes that before something can be appreciated it must be understood. One of his first acts as ASA president was to start a campaign explaining the group's work in down-to-earth language. It paid off.

Today ASA has more members, higher income and higher morale. The number of standards it has given industry has increased. For the first time since the war, ASA winds up a year in the black.

Tom Jolly is vice-president in charge of engineering and purchases for Aluminum Co. of America—one of the few men in industry to hold this dual title. And he's past president of the National Assn. of Purchasing Agents.

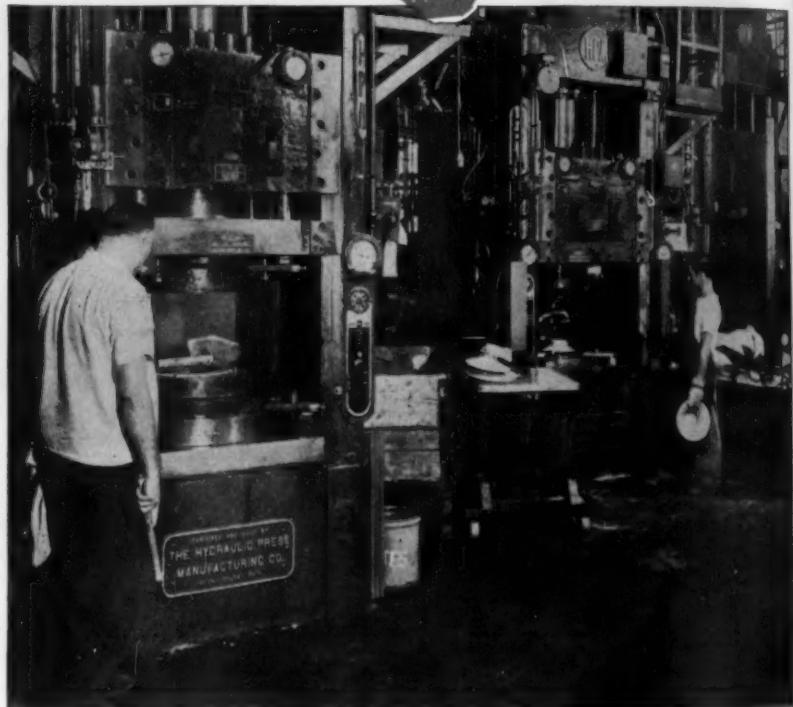
During World War II Tom made the big decisions on Alcoa's \$300 million expansion program as well as the 40-odd plants costing \$750 million which Alcoa built and operated for the government. He started with Alcoa in 1915 as a draftsman.

Tom's hobby is farming. He's the fifth generation, and the fourth Tom Jolly, to run the 233-acre Butler County, Pa., farm handed down from his great grandfather. His Hereford cattle this year took five prizes—including three firsts—at two fairs.

Here's how PRATT & WHITNEY AIRCRAFT does it!

Production men know that when you talk about drawing and forming alloys which are composed largely of nickel and chromium—you have a tough job ahead. Yet at Pratt & Whitney in East Hartford, Connecticut, such alloy pressings are economically handled by 5 H-P-M FASTRAVERSE Presses for the Pratt & Whitney Aircraft J-42 Turbo-Wasp (gas turbine) engine. Moreover, these parts are drawn to very close limits to avoid machining and yet allow the close fits required for welding. Stainless (AMS 5510) as well as low carbon steels are also formed on these presses.

The choice of H-P-M presses for this job is just an example of the leadership H-P-M enjoys in the metal working fields. H-P-M features such as wide ranges of operational speeds and controls . . . automatic cycle . . . FASTRAVERSE "closed-circuit" hydraulic power system . . . low scrap loss and top operating economies are just a few reasons why H-P-M presses can solve your production problems. Call an H-P-M engineer today.



Send for a free copy of Bulletin 5005 which completely explains H-P-M FASTRAVERSE Press operations and features — and also describes "special application" H-P-M Presses.



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The Iron Age

INTRODUCES

Joseph M. Frost, appointed purchasing agent of the Braeburn Alloy Steel Div., CONTINENTAL COPPER & STEEL INDUSTRIES, INC., Braeburn, Pa.

Malvern J. Hiler, appointed president of COMMONWEALTH ENGINEERING CO., Dayton.

W. R. Leopold, appointed to direct the operations of the Public Works Div., WORTHINGTON PUMP & MACHINERY CORP. George P. Passmore, named assistant to vice-president manufacturing; A. M. Tullo, works manager, Wellsville plant; John Burlick, assistant to works manager, Harrison; Max A. Heyman, assistant to works manager at Harrison; W. D. Sizer, manager, regional engineering and service department; George F. Habach, executive engineer at Harrison.

Horace W. Potter, promoted to assistant to the openhearth superintendent of LUKENS STEEL CO., Coatesville, Pa. Joseph C. Henry, Jr., named assistant superintendent and Harry C. Paxson, named assistant to the superintendent, Refractories & Fuel Dept.

William V. Shakespeare, named sales manager, export sales division, THOR CORP., New York.

John W. Belanger and Nicholas M. DuChemin, elected vice-presidents of the GENERAL ELECTRIC CO., Schenectady.

Robert P. Bremner, appointed assistant to the vice-president in charge of operations for the YOUNGSTOWN SHEET & TUBE CO., Youngstown.

Robert C. Becherer, elected executive vice-president of LINK-BELT CO., Chicago. Richard E. Whinrey has been appointed general manager at the Ewart plant, Indianapolis.

William G. Polley, appointed district sales manager, Atlanta, for ACME STEEL CO. Replacing Mr. Polley as southern area special representative is Charles R. Lammers.

Charles H. Cecil, appointed vice-president of the NORTHWESTERN STEEL & WIRE CO., Sterling, Ill.

James H. Wolcott, named sales manager of the Machinery Div., REED-PRENTICE CORP., Worcester.

Wenzel A. Lindfors, appointed sales manager of the NEW YORK BELTING & PACKING CO. Mr. Lindfors will make his headquarters in Passaic, N. J.

Henry T. Rittman, Jr., succeeds Cecil H. Fisher as manager of the storage and delivery section, explosives department, E. I. DU PONT DE NEMOURS & CO., INC., Wilmington, Del. Walter H. Salzenbert, appointed assistant general manager of the company's Grasselli Chemical department.

Arthur H. Sy, named vice-president in charge of sales for AMERICAN DISTRICT STEAM CO., INC., North Tonawanda, N. Y.

Richard W. Plummer, heads the Latin American office of ARTHUR D. LITTLE, INC., Mexico City.

Grier D. Patterson, elected a director of FOOTE BROS. GEAR & MACHINE CORP., Chicago.

Dr. Victor S. Hicks, appointed chief physicist of TRACERLAB, INC., Boston.

Daniel W. Kallman and John T. O'Rourke, appointed sales engineers of the Eastern Div., BRITISH-AMERICAN CARBON CORP., New York.

Turn Page



HARVEY J. HAUGHTON, appointed assistant to executive vice-president, Jones & Laughlin Steel Corp., Pittsburgh.



R. B. REID, appointed assistant manager, advertising-sales promotion department, Apparatus Marketing Div., General Electric Co., Schenectady.



JOHN G. MOORHEAD, 33-year veteran at the Chevrolet-Detroit Forge Div., appointed plant manager.



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You should have the current copy of the Curry List of available steel plant equipment. Write for your copy today!

See our ad on page 164



Personnel

Continued

Joseph Joiner, Jr., elected to the board of directors of BAKER-RAU-LANG CO., Cleveland. Other directors elected: A. Douglass Hall, George Miller, Wesley A. Stranger, Jr., and Robert H. Davies. William A. Bauer was elected chairman of the board.

R. B. MacKenzie, appointed assistant sales manager of the PARKER APPLIANCE CO., Cleveland.

Robert A. Campbell, joined BALL BROS. CO. as a special assistant to the vice-president and manager of glass manufacturing in Muncie, Ind., Okmulgee, Okla., and Hillsboro, Ill.

Albert W. Smith, Jr., appointed comptroller of STEEL IMPROVEMENT & FORGE CO., Cleveland.

Robert M. Hoel, appointed sales agent for the AMERICAN CAR & FOUNDRY CO., Chicago.

Rudolph J. Lesnick, appointed chief engineer of the GORHAM TOOL CO., Detroit.

Robert F. Hartmann and Richard F. Adams, appointed to the metal products department, research and development division, by OLIN INDUSTRIES, INC., East Alton, Ill.

Lloyd R. Jackson, named an assistant director of BATTELLE INSTITUTE, Columbus, Ohio.

Ross Anderson, appointed sales manager, Northern Div., INGALLS IRON WORKS CO. with headquarters in New York.

Ray G. Pinkerton, joined the Peerless Div. of the EASTERN FOUNDRY CO., Boyertown, Pa., as sales manager in charge of the sale of Peerless boilers for all fuels and tank heaters for coal firing.

James W. Murray, promoted to general sales manager by FABRATORS STEEL & MFG. CORP., New York.

Frederick W. Muller, appointed sales manager of Calumet Division products other than refined copper for CALUMET & HECLA CONSOLIDATED COPPER CO., Calumet, Mich.

Thomas Payton, appointed assistant sales manager, Commercial Equipment Div., CORY CORP., Chicago. Walter W. Rogers has been appointed national service manager for the newly consolidated service department.



CHARLES P. HAMMOND, recently appointed general superintendent of Green River Steel Corp., Owensboro, Ky.



J. O. CAVANAGH, joined Alloy Rods Co., York, Pa., in the capacity of technical director.



GUNNAR PALMGREN, recently elected a vice-president of S K F Industries, Inc., Philadelphia.



WALTER KILIMNIK, appointed manager of the alloy division of U. S. Steel Supply Co., Chicago.



REDUCE LOAD BREAKAGE—Big burly Mono-Cushions soak up shock without sacrificing stability, save plenty of money in moving fragile loads.

REDUCE MAINTENANCE—Mono-Cushions soak up so much shock and shock load that they reduce maintenance on bearings, steering linkages and driving trains as much as 40%.

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THE MANUFACTURER OF YOUR VEHICLES can supply you, through his service branches, with the type of Monarch Tire engineered for your equipment.

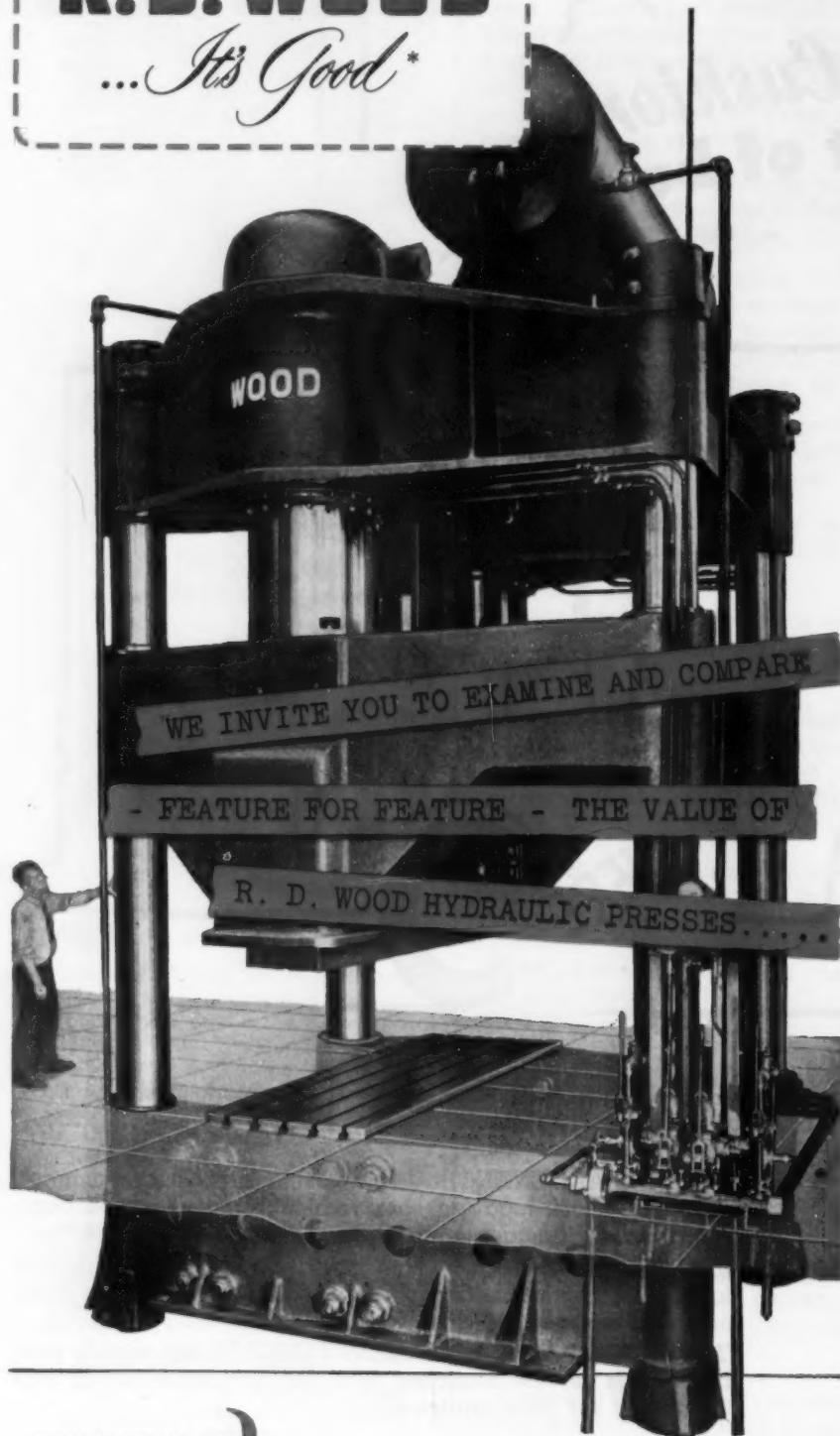


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Personnel

Continued

H. Gilbert Steward, appointed Southern territory district manager for **ATLAS CHAIN & MFG. CO.**, Philadelphia.

R. E. Howard, appointed comptroller and assistant treasurer of the **DAVEY COMPRESSOR CO.**, Kent, Ohio.

George T. Humphrey, Jr., appointed assistant general manager, service sales division, **TIMKEN ROLLER BEARING CO.**, Canton, Ohio.

Jack W. Clark, appointed consultant in the development of beryl ore mining of **BERYLLIUM DEVELOPMENT, INC.**, Reading, Pa. Mr. Clark will also act as technical director for all mining operations in United States and Canada.

Harold F. Mowry, named assistant treasurer of the **AMERICAN CLAD-METALS CO.**, Carnegie, Pa.

Frank Zacher, named director of personnel for **NORTON CO.**, Worcester.

H. Albert Ford, elected vice-president and sales manager of the **GEN-EVA METAL WHEEL CO.**, Geneva, Ohio.

Andrew TenEyck, appointed as sales manager of **SOSS MFG. CO.**, Detroit.

Harris C. Miller, assigned to sales territory comprising upper New York state and western Pennsylvania for **HOOKER ELECTROCHEMICAL CO.**

OBITUARIES

Harry F. Miter, vice-president, Austin Co., at home in Cleveland. Mr. Miter joined Austin in 1917 as chief engineer and chief estimator.

John C. Huffman, 48, district manager, Cleveland territory for the Braeburn Alloy Steel Corp., Braeburn, Pa.

William Hughes, 88, who constructed three steam driven automobiles in his bicycle shop in 1896 in Providence, and subsequently the first Reo agent in Rhode Island, Connecticut and parts of Massachusetts.

Thomas L. Lord, former president of the C. F. Pease Co., at Sturgeon Bay, Wis., at the age of 71.

FERROCHROMIUM

from low grade ore finds wide use



By J. J. Grady
President
Exothermic Alloy Sales & Service, Inc.
Chicago

In addition to permitting much closer control of chromium content without chilling the steel bath, exothermic ferrochromium utilizes low grade chromium ores. Chrom-X, used in the ladle only, is but one of the available alloys.

The principal U. S. chrome ore resources consist of chromites of subcommercial rations of chromium to iron and with more magnesia and alumina than is wanted for the standard electric smelting procedures. The development of the Udy process by the Chromium Mining and Smelting Corp. which utilizes low grade ores was therefore a metallurgical innovation of great importance to this country.

This process was developed, primarily, to utilize off-grade ores such as those found in the United States and Canada. Chrom-X is the trade name for ferro-chrome, made from low-grade chrome ore.

A discussion of exothermic ferroalloys necessarily involves discussion of the general subject of ferroalloys. Also, talk of ferroalloys necessitates mention of alloy steels, for the two are interdependent. Present day large scale production of alloy steels could not exist without the development of high purity ferroalloys. The

exothermic ferroalloys have further enabled alloy steel producers to obtain greater flexibility and economic production together with improvement in quality.

The ferroalloys in most common use are those of Manganese, Silicon and Chromium. Exothermic ferrochrome is more widely used at present than are the other exothermic ferroalloys.

The raw materials for the common ferroalloys are ores which are chiefly oxide. The ferroalloy is derived by reduction. In the case of ferro-chromium, the raw material is chromite ore. Chromite, unlike most metallic ore minerals, is not accompanied by other minerals that betray its presence, as, for instance, quartz and pyrite may indicate gold; and there is no proven method not involving penetration for finding concealed ore bodies within the periodotite host rock. Chromite ore, in order to be of satisfactory metallurgical grade, should contain a minimum chromic oxide content (Cr_2O_3) of 48 pct, and

Exothermic ferrochromium (continued)

chromium-iron ratio of 3 to 1. If the chrome ore is too rich in iron, the effective capacity of the furnace, in terms of chromium metal, is reduced and production costs increase rapidly.

During World War II over 30,000 tons of Montana concentrates were converted by Chromium Mining and Smelting Corporation to Chrom-X, which was used for the manufacture of iron and steel that was directly connected with our defense effort. There are still some 70,000 tons of these concentrates in stock pile. The Udy process is the only known satisfactory method of using these low grade concentrates.

NaNO₃ is oxidizing agent

High Carbon Chrom-X is a mixture of ferrochrome, carbon and silicon and an oxidizing agent, NaNO₃, and is so compounded that it will react exothermically when added to molten iron or steel. The material from which Chrom-X is made is finely ground, and so intimately mixed that the reaction, once started, progresses rapidly, insuring thorough mixing of the ferrochrome with the metal.

High Carbon Chrom-X comes to the consumer in briquette form and is packed in cans. Each can contains 25 lb of chromium. This method of packaging facilitates the handling of Chrom-X since it eliminates the necessity for weighing and analyzing the product before adding to the ladle. All the melt shop has to do is to count the number of cans, each of which contains specific weight of contained chromium. The right weight of a given furnace addition is thus easily and quickly achieved.

Cr recovery is 95 pct

Reports received from all consumers currently using high Carbon Chrom-X in the openhearth indicate that chromium recoveries of 95 pct are consistently being obtained. Higher recoveries have been obtained in the electric furnace under a reducing slag. The uniformity of Chrom-X makes it possible to hold the chromium specifications to a narrower range than is usually experienced via conventional ferrochromium addition. In case steel producers want to hit the high or

low side of the standard chromium spec depending on the rest of the heat analysis and the end use of the product.

The cost of chrome per pound recovered in the ingot is definitely lowered by the many advantages which Chrom-X has over standard ferrochrome. Some of these advantages are listed in the Table.

For ladle additions the procedure for using Chrom-X is simple. The heat is worked/handled in a normal manner up until the time of tapping. The optimum results are obtained by adding the Chrom-X in the bottom of the ladle before tapping. The reaction is completed rapidly, insuring thorough mixing and even distribution of the chromium.

The oxidation of the silicon produces sufficient heat to raise the temperature of the reaction products to steel making temperatures. The amount of heat produced can be controlled so that the metal to which Chrom-X is added will be neither chilled nor overheated. This method overcomes the objection of chilling resulting from large additions of cold material to the metal.

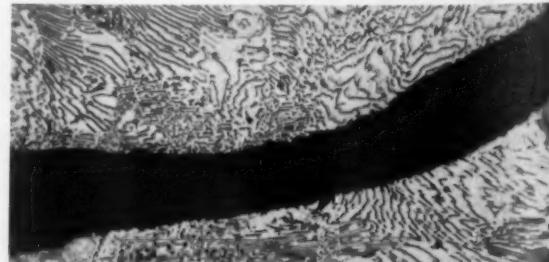
Chrom-X saves fuel

In normal basic openhearth practice, it is difficult and costly to attain the excess of temperature necessary to melt standard ferroalloys and to bring them up to the desired tapping temperature of steel. If the furnace is efficient in heat input, there is a tendency to over-compensate for the temperature drop caused by the ferroalloy addition and, consequently, to tap the heat too hot. This is understandable since the detrimental effects of cold heats are more apparent and immediately reflect on the melters ability to control temperature. From the production standpoint, excess temperature means loss of fuel, furnace time, bad bottoms, stool leak-outs, mold erosion, and sticker ingots.

The effects of the extremes of temperature often occasioned by the use of standard ferroalloys are obviated by the exothermic alloys. Any sizable quantities of standard ferroalloys must be added to the furnace, as distinguished from the ladle, to insure solution, mixing, and



TYPICAL MICROSTRUCTURES of cast iron with and without Carb-X, another exothermic addition agent. The photo at left shows the microstructure of a Carb-X inoculated mold-stool heat. Typical microstructure of untreated iron appears at the right, 500X. Carb-X is a mixture of graphite and sodium nitrate.



pick-up in temperature. Furnace addition means extra furnace time, greater loss of alloy through oxidation and the possibility of slag reversions.

Another benefit of the exothermic reaction is the production of a fluid slag which has a definite cleansing effect on the steel. This slag assists in removing such oxides as Al_2O_3 , FeO , CaO and MgO . Exceptionally clean openhearth steel is now being made through the use of Chrom-X as a ladle addition. In addition to Chrom-X, Chromium Mining and Smelting Corp. also produces Sil-X, Man-T, Man-X and Carb-X.

Sil-X also conditions slag

Exothermic ferrosilicon is produced in much the same manner as is exothermic ferrochromium. Sil-X as a source of silicon may be used as a ladle addition, and the amount used is optional. The heat generated through the exothermic reaction has, in many cases, prevented skulls when a slow tap is involved. Sil-X may be used, also, as a slag conditioner. In the case of heavy lumpy lime slag, two or three boxes of Sil-X added to the slag will rapidly dissolve the lime. Also, the condition frequently arises where the slag appears to be deficient in lime, but the addition of Sil-X flattens out the slag and in many cases reveals a large amount of undissolved lime which had been concealed by the action and foaminess of the slag. When this already present lime goes into solution, a normal slag is obtained. Where a heat melts out at a lower than usual carbon content, Sil-X may be used to temporarily hold the carbon, and shape up the slag sufficiently, allowing the heat to pick up temperature to insure a good tap.

Man-T conserves manganese

Standard ferromanganese is produced by reduction of manganese ores. Its reduction presents the same problem as the chrome ores, that is, a minimum ratio of manganese to iron must be maintained. A high iron content requires additional heat input by the steel producer. However, an exothermic ferromanganese can be used advantageously on selected steel grades. (Those with a specification over 0.70 pct Mn.)

Most steel plants have a restriction on the amount of ferromanganese that may be added to the ladle. The average Mn per ton for the industry is 13.2 lb. This figure will undoubtedly have to be reduced now because of the reduction of the Mn content in standard ferromanganese from 80 pct to 70 pct. If the required manganese addition exceeds this figure, any excess must be added to the furnace. It is common knowledge that manganese additions in the furnace are costly and that recoveries are very low. In the case of exothermic ferromanganese, any given amount may be added to the ladle with complete assurance that a uniform distribution of manganese throughout the metal will be obtained.

Recoveries have been reported as high as 95 pct with an average of about 90 pct. There is a considerable tonnage of line pipe steel being made at the present time with an average manganese specification of over 1.00 pct. Man-X, the trade name for exothermic ferromanganese, has been used successfully to the full manganese specification. On a fifteen ingot heat the manganese has not varied more than 0.04 points from the first to the last ingot poured.

ADVANTAGES OF CHROM-X

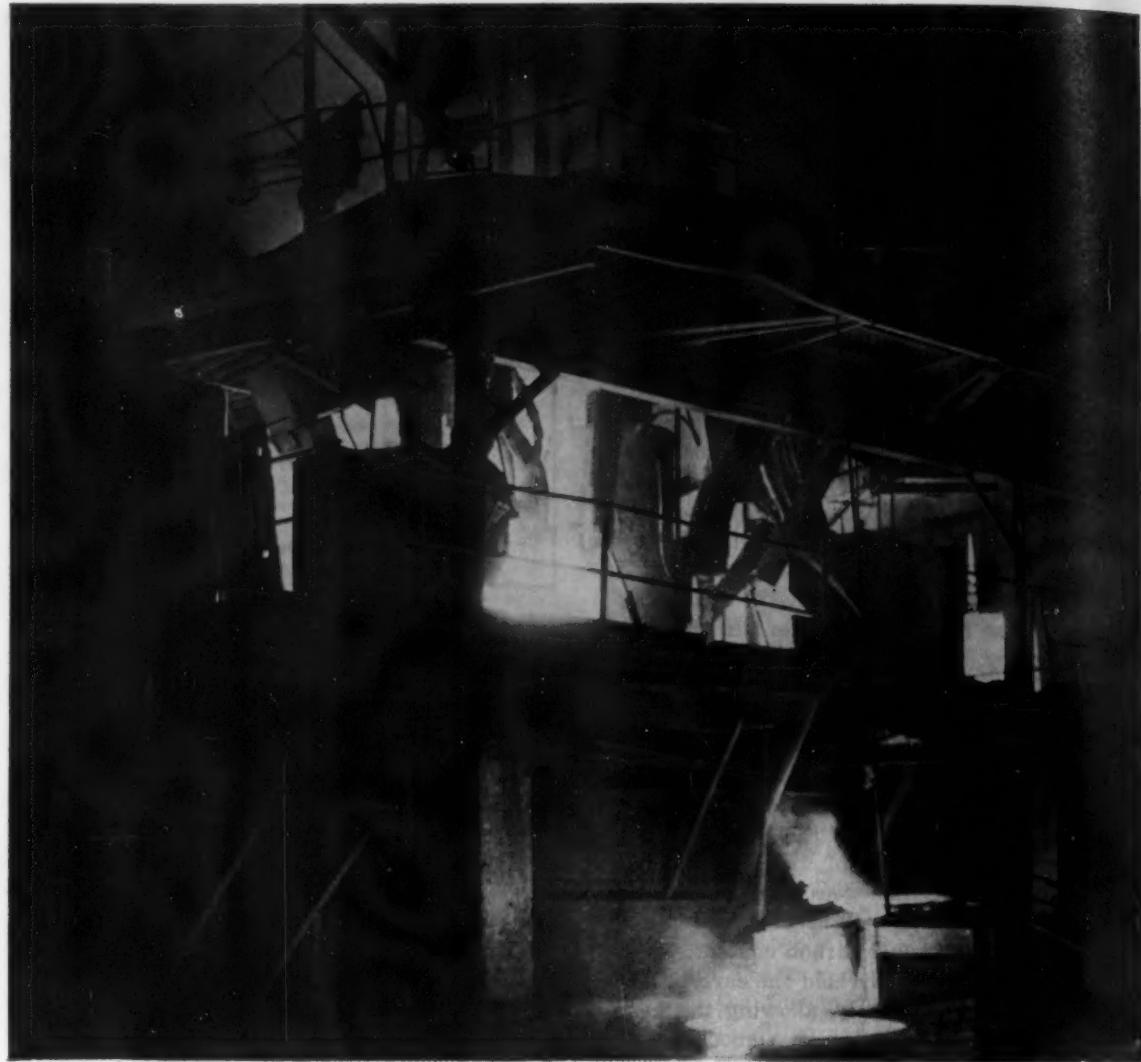
1. No change in equipment.
2. Decreased furnace time and considerable saving of fuel.
3. No chilling effect in the ladle.
4. No weighing or analyzing necessary.
5. Accurate gauge of carbon pick-up possible.
6. Easier handling and storing.
7. High chromium recoveries with uniform distribution.

Manganese conservation has become of extreme importance to our nation's welfare, and Chromium Mining and Smelting Corporation is now developing methods to utilize this country's supply of low-grade manganese ores. This exothermic product, known as Man-T, is produced solely from domestic ores by properly mixing silico-manganese and manganese ore. The silicon content of the silicomanganese in the exothermic product can be regulated to control the availability of silicon to the steel from none to any normal required amount.

To date three plants using several carloads of Man-T experimentally have reported a consistent Mn recovery of 75 pct. Twenty-five pct of the manganese content of Man-T is derived from the direct reduction of the ore during the exothermic reaction, while the balance is derived from the silicomanganese. This direct reduction of the ore in the steel ladle not only produces a greater over all recovery of manganese from ore to ingot but also reflects operative economies.

The techniques involved in the production of exothermic ferroalloys have found use in the development of products which are not used to meet chemical specifications, but for various other applications. One of such products is Carb-X, a mechanical mixture of graphite and sodium nitrate, used for modifying the characteristics of cast iron.

For a considerable time, producers of molds and stools have been directing their attention toward the attainment of microstructure containing a high percentage of ferrite and a low percentage of combined carbon. Various attempts have been made to obtain this microstructure through the use of such materials as Bessemer iron, partially blown Bessemer iron and cupola iron melted to a specific analysis. Through research work carried on with the co-



POURING A HEAT of exothermic ferrochromium at the Sault St. Marie plant of Chromium Mining and Smelting, Ltd.

Exothermic ferrochromium (continued)

operation of one of the mid-western plants, Carb-X was shown to be the most successful available agent for producing the desired micro-structure with its resultant longer service life. The accompanying microstructure obtained showed much less combined carbon and a finer graphite distribution with Carb-X.

The usefulness of exothermic alloys in themselves are unlimited in scope. Chrom-X has been used in the manufacture of all types of openhearth chrome bearing steels, and, to the best of our knowledge, no heat has been rejected on inclusion count or grain size through its use. A rapid and complete dispersion of the ferrochromium throughout the molten metal results in a saving of heat line. The amount of Chrom-X to be added is optional, and, through the use of low carbon Chrom-X, it would be entirely possible to produce some of the milder stainless steels of the 12 pct Cr type in an openhearth.

During the present day trend to large furnaces, (350 tons to 500 tons), bifurcated spouts and double ladles, the use of exothermic alloys is proving of benefit to steel producers. There are a number of plants that are not in a position to carry large inventories, and, consequently, desire only a portion of a heat. With exothermic alloys, from the same heat, a nickel chrome grade has been made in one ladle and semi-killed steel in the other ladle. This method relieves the openhearth producer of having to stock portions of a heat, with a resultant loss of yield and the added expense of reheating cold ingots at a later date.

Normal care must be exercised in the storage of exothermic ferroalloys. To preserve their exothermicity these products must be kept dry. Because they are designed to ignite at temperatures in excess of 750°F or 385 Centigrade, they should not be stored close to furnaces, hot metal, cutting torches, operations or other sources of heat in the plant.

Good plating techniques SAVE MONEY, CUT STREAM POLLUTION

Good housekeeping and close control of plating room processes can cut waste and save money for metal finishers while aiding in abatement of stream pollution. A study by the Ohio River Valley Sanitation Commission shows much valuable plating materials now wasted in streams can be salvaged and reused.

Metalfinishers can cut production costs and further stream pollution abatement by good housekeeping and close control of plating room processes, a study by the Ohio River Valley Sanitation Commission has shown.

Such control methods include: Reduction in dragout and incidental losses of plating materials; purification and reuse of contaminated processing baths; exchange or sale of processing baths that cannot be purified; installation of waste treatment facilities. Treatment of waste is expensive; control of waste is profitable.

Cut loss to sewers

The metalfinishing industry requires large volumes of water and can take advantage of dilution factors by keeping dragout at a minimum. Where contaminants in waste waters are too high, a reduction may be attained by more efficient use of plating chemicals and by reducing losses to sewers.

Many platers have heedlessly wasted metal salts and acids by improper rinsing or leakage. Batches of partly contaminated and weak solutions are dumped with no effort at salvage. Breaks in lines, vats or storage units add to the size and cost of waste-treatment facilities.

Work from processing baths should drain thoroughly unless such practice interferes with quality. In manual or hoist-operated equipment, if timing permits, work may drain over the tank a few seconds. An automatically-timed, hoist-raising device will provide an adequate period for drainage. These are cheaper to use than waste-treatment facilities.

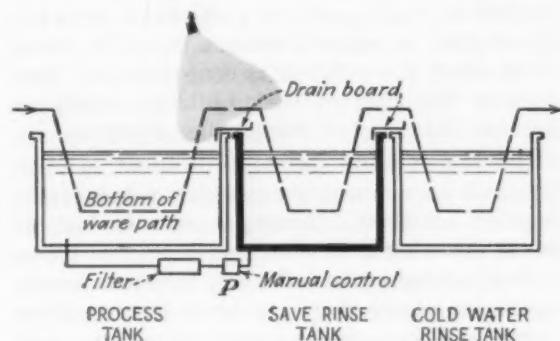
A bar over hand-operated tanks serves as a resting place for small racks while work is

draining. In one case, use of a drainage bar on a hand-operated chromium tank for plating hub caps cut chromic-acid consumption from 16 to 3 lb per 1000 hub caps processed. A saving of \$3.64 per 1000 caps with no increase in labor resulted. The chromic-acid did not have to be removed from the plant effluent and was available for further plating.

This principle, work drainage, applies to all types of plating and processing. Where high temperatures leads to surface drying, drainage is practical with fog rinses.

Any solution on work moving from the processing bath should be rinsed in a save-rinse tank. Rinse water should be returned to the processing tank. Save-rinse tanks are particularly necessary if the operation does not allow thorough work drainage.

Dragout losses account for 60 to 100 per cent of supply costs—excepting anodes—depending on the type of plating operation. One save-rinse tank may reduce chemical supplies used by 60



RECOVERY SYSTEM uses steam condensate for spray and process tank supply. Fog nozzle uses about 2 gal of condensate per hour, effectively removes solution.

Plating techniques (continued)

pct; two, by 80 pct. Chemicals salvaged need not be removed from the waste water.

The extent to which metal salts build up in save-rinse solutions and the design of parts processed should determine the number of rinses. Concentration in the last rinse should not exceed 5 pct of the processing bath. Operation of a number of rinses may add to labor costs in the metalfinishing department but additional labor is needed for waste treatment.

Pumps, airlifts or siphons should permit easy return of save-rinse solution to the processing bath. It should be difficult for an operator to add fresh water to a processing bath.

Processing bath evaporation is often slow and effective use of save-rinse solutions difficult. In such cases solutions should be concentrated by heating. Impurities hindering solution recovery can be minimized by using properly lined tanks. Some impurities may be removed by deionization. Draining of water to processing tanks can be reduced by draining work thoroughly.

In some cases draining can be minimized by tumbling work in an empty tank preceding plating. The level in the plating tank drops through normal operation and permits additions of save-rinse solution. Frequent return of save-rinse solution to the plating bath cuts losses of plating material to rinse water.

One company saved plating solution by adding another cam to its barrel-plating units. The barrels rotated and drained 1 min before entering the save-rinse and flowing-rinse tanks.

An air blow-off will dislodge plating solution when work is transferred to save-rinse tanks. Incidental drip of solution to sewers can be prevented by installing drip boards between tanks. This also reduces corrosion on the outside of tanks.

Coated racks cut dragout

Racks should be free of metal buildup or corrosion. Clusters of nodules on plating racks do not rinse freely. Properly maintained and coated plating racks save money. Plate deposited on rack parts, or rack metal attacked by solution, is material wasted. When the metal is attacked, the solution is contaminated. Frequently the area of rack build-up equals or exceeds the area of work being processed.

Coating of racks decreases dragout in cavities and on exposed area, which poisons subsequent solutions. Coating also cuts loss of metal that should be plated on processed parts. Life of coated racks is longer, rack-arm breakage is lower and there are fewer interruptions.

Fine-mist sprays can be used on the exit end of processing and save-rinse tanks. Fog nozzles can be operated intermittently as the machine indexes. Pedal operated valves can

be utilized on hand-operated tanks. Parts should be racked uniformly to speed drainage and avoid contamination of other solutions.

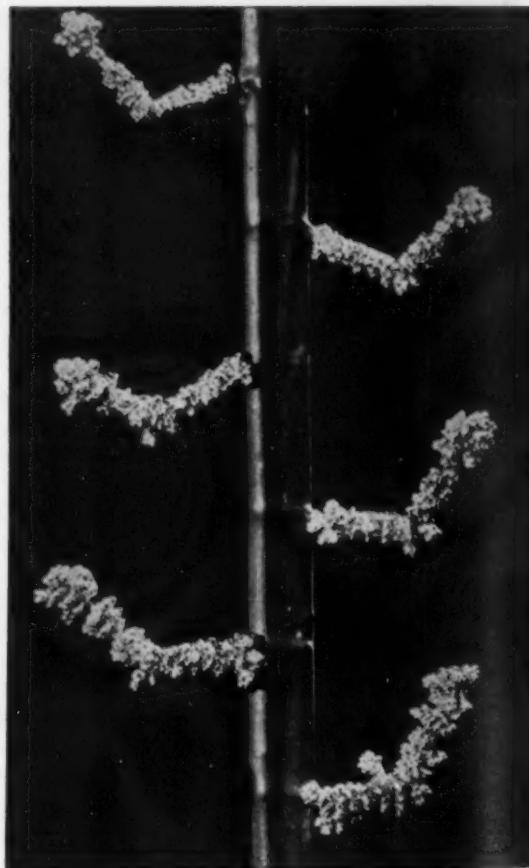
Thorough rinsing depends on passing the processed part through clean water. In final-rinse tanks this can be done with minimum water by providing a dam-type overflow across the tank. Fresh water should be introduced at the bottom end of the tank opposite the exit. Excessive rinse water should be avoided.

Leaks are costly and cause waste-water contamination. Routine inspections and maintenance of all equipment, including empty tanks, should be scheduled.

One company installed electrodes for continuous measurement of specific conductance in the steam condensate line used in heating plating solutions. A rise in conductance, signaled by a red light, indicates a leak in the steam line in the plating solution. When this occurs steam is shut off and compressed air applied to the line. The leak is located by air bubbles in the plating solution.

Pipelines and equipment used for transferring solutions should be in plain view. Filters, pumps and similar equipment should be mounted over collector tanks or drain boards that lead to process tanks.

Pipelines for filling tanks should discharge



COATING PROTECTS center spline of this plating rack. Pits and crevices on unprotected hooks drag out much valuable plating solution from tanks, boost plating costs.

above the normal solution level. The operator can then tell when the supply is off or on. Also, an airbreak prevents back siphonage and contamination of drinking water.

To prevent foaming when wetting agents are used, makeup should be added through a funnel and pipe extending below the surface. The water inlet should be located above the funnel for visual control.

Float valves can prevent overflowing in case of a break in the steam line, or if the makeup feed line is left open. Storage tanks, sumps or pits without drains may save a bath if a processing tank springs a leak. This safeguard is usually located below the process tank. Solution caught is eventually returned to the process tank. Another method is to install the process tank within a tank. If the process tank

springs a leak, the outer shell will save the solution.

Floor drains offer a temptation for quick, easy and unreported disposal of spills of solution or oil. Plugging the drains necessitates dry-spill disposal by sweeping or shoveling some inert absorbing medium, such as Fuller's earth. This method of cleaning floors is particularly applicable to chemical-storage rooms where protective measures should be instituted against loss by spilling or leaching.

The practice of discarding solutions which could be purified represents money down the drain. No company can afford to discard any processing solution without first proving it has no recoverable plating value. It is cheaper to provide storage facilities for contaminated solutions that can be salvaged.

Chrome plating affects plastic deformation of steel

Tests at the National Bureau of Standards indicate that chromium plating appreciably reduces the plastic deformation that can occur in SAE 4130 steel before fracture. Generally, however, the ability of the plated specimens to undergo plastic deformation was substantially increased by baking at temperatures between 100° and 440°C.

Tensile tests were made on specimens plated to nominal thicknesses of 0.0001 to 0.015 in., as well as on unplated specimens. Average values for the tensile properties of the unplated steel were: Tensile strength, 187,300 psi; yield strength, 175,900 psi; elongation in a 2-in. length, 13 pct; true stress at beginning of fracture, 270,900 psi; original area of specimen divided by area at beginning of fracture, 2.088. It was found that the tensile and yield strengths decreased with increasing plate thickness until, at a thickness of 0.015 in., the values were about 90 pct of those for the unplated steel.

Baking at 200° and 400°C did not produce any appreciable change in these properties. Plating to a thickness of 0.010 in. reduced the true stress at beginning of fracture to about 80 pct and the percentage elongation and true strain at beginning of fracture to less than 60 pct of that of the unplated steel. However, the baking of plated specimens at 200° or 440°C appreciably increased the values obtained for these properties.

Tensile impact tests were made with the cooperation of the New York Naval Shipyard. These tests were conducted at room temperature; the striking velocity was 27.8 fps. The unplated steel elongated 15.8 pct, absorbing 464 ft-lb of energy at failure; reduction in area

was 55.2 pct. The tensile impact properties of plated specimens were 93 pct or more of those of the unplated steel and were not appreciably changed by baking at temperatures up to 300°C.

Bend tests were made in a universal testing machine on specimens having a diameter of 0.500 in. and a length of 10 in. Although unplated specimens could be bent as far as possible in the machine without failure, specimens plated to a thickness of 0.015 in. failed after they had been bent through an angle of about 40°. Plated specimens baked at temperatures of 200° to 400°C could be bent through angles of 70° to 85° before failure. The moduli of rupture of plated specimens baked at these temperatures were equal to that of the unplated steel samples tested.

Tested under compression

In crushing tests, specimens machined to close tolerances from heavy-walled tubing were tested either as machined, after plating on the inside and outside surfaces to a thickness of about 0.010 in., or after plating to this thickness and baking at temperatures between 100° and 400°C. The specimens were tested to failure by compression between the stationary and movable heads of a universal testing machine in which the load was applied along a diameter of the tube. Plating increased the load necessary to crush the specimen by a factor of about 1.2 and reduced the deformation at failure to approximately 9 pct of that of the unplated steel. Baking at temperatures of 200° to 400°C increased the load necessary to produce failure about 1.4 times and increased the deformation to about 55 pct of that of the unplated steel.

HIGHER PRODUCTION WITH RADIALLY-FED gear shaver



By George Elwers
Machinery Editor

General Motors has modified two Michigan gear shavers for straight radial feed. Neither the cutter nor the work reciprocates. Cutter breakage is reduced, so tool costs are lower. Production is almost double that of unmodified machines. Lower machine repair costs are expected.

Radially-fed gear shaving, long thought impractical, is being successfully done at General Motors' Detroit Transmission plant. Production has been nearly doubled and cutter cost per piece greatly reduced, in contrast with conventional shaving.

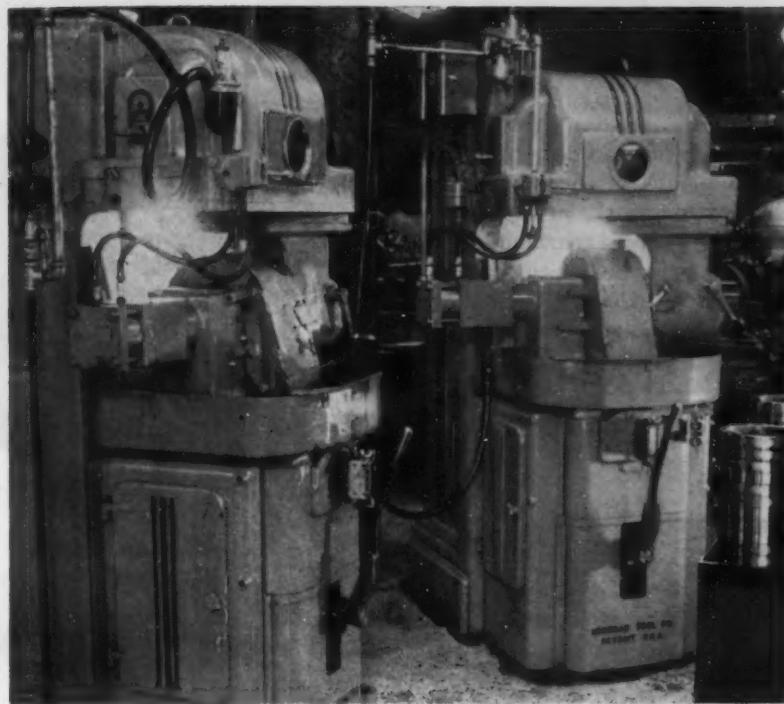
The part now being finished by this method is a Hydramatic transmission rear unit internal gear having 67 teeth. Material is 5140 steel. The machines used are Michigan Tool Co. Model 860-C gear shavers, modified by General Motors and equipped with special Michigan cutters.

The major modifications have been disconnection of the cutter reciprocating motors, installation of heavier work spindles, and changes in the electrical systems to obtain the desired new cycle of operations. On these modified machines, neither the cutter nor the work reciprocate. Of course both revolve, the cutter doing the driving. The cutter is merely ad-

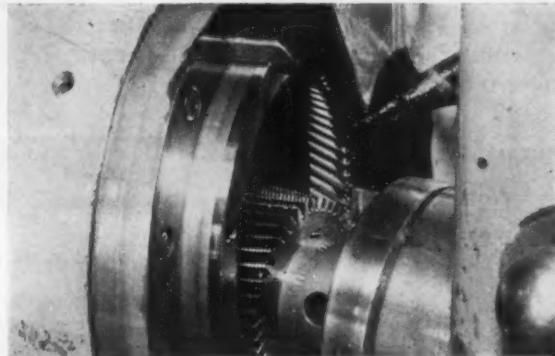
vanced into cutting position, and the gear fed radially into it. The work feeds to depth in 15 sec. The entire cycle, which takes about 38 sec, includes two reverses of direction of rotation.

Cutter has crown

Development of radially-fed gear shaving by General Motors and Michigan Tool, included design of a special cutter. It has serrations staggered in a right hand spiral on a left hand cutter. The cutter has a slight crown. The position and the correct amount of crown is an important factor in the success of this method of gear shaving. There were no data available on how much crown to design into the cutter, so it was calculated as near as possible and corrected slightly after the initial tests for tooth contact were made. The cutter is 18-4-1 high speed steel, and has 41 teeth. A



THE TWO GEAR SHAVERS, Michigan Model 860-C, modified by General Motors for radially-fed gear shaving.



SPECIAL CUTTER shows in this closeup of the cutting operation. Neither cutter nor workpiece reciprocates. Cutter moves into place, then feeds radially into work.

smaller cutter for this job is being developed. One of the problems in cutting internal gears is chip removal. Centrifugal force tends to keep the chips in the gear. Since this machine does not have the reciprocating action which helps clear out chips, considerable attention has to be paid to maintaining an adequate and properly-directed flow of cutting oil. The oil used is GMC-25 shaving oil, about 15 pet fat.

Stock removal is 0.004 to 0.006 in. between pins. Pitch diameter and pin-to-pin dimensions are held to within 0.002 in.

Cutters average about 4000 pieces per grind, and last for an average 4 grinds. This gives

approximately 20,000 pieces per cutter, which is slightly better than the performance of the standard gear shavers used on the same gear. However, cutter breakage is much lower. Thus, cutter cost per piece is reduced, though the special cutters themselves are more expensive than standard. There will also be some savings in machine repair costs because less cutter breakage means fewer spindle repairs.

Two machines of this type are now in use at Detroit Transmission Division. Their net production is 129 gears per hr as compared to 70.8 per hr from two standard Michigan Model 860-C machines.

Lower cost hot top increases ingot yield

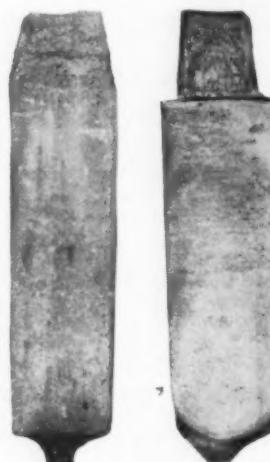
Cheaper maintenance and greater ingot yield are claimed for a new hot top developed by J. H. Jones, divisional superintendent of the Massillon plant of Republic Steel Corp. Claims are based on nearly 2½ years' experience.

Hot-top costs, including cost of re-equipping, are said to be approximately 15¢ per ton below costs at certain other Republic plants. Ingot yield has been increased approximately 4 pct. This is due to elimination of poor surface condition that usually developed at junction of hot top and ingot mold with equipment formerly used.

Shell has refractory lining

The new hot top consists of a cast steel shell—heavier than the conventional hot top—lined with a refractory. It weighs approximately 1 ton. With a minimum of maintenance, usually consisting of coating with a slurry compound before each heat, the hot top casting will stand up indefinitely.

Experience to date has been with tops designed for 23½ x 23½ in. ingot mold, but refractory brick is so shaped that the top may be adapted to any size mold. Ingot weight is 10,000 lb. Hot top is anchored to mold with steel pins set in open slots at base of top on either side. The open slots permit "breathing" with mold as it expands under temperature.



COMPARING INGOTS cast with the new hot top (at left) and with conventional equipment (right) shows difference in surface condition at junction of hot top and mold.

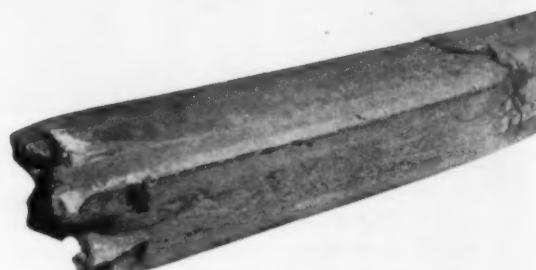
CLOSE-UP of rolled product from ingot cast with the new hot top in use at Republic's Massillon plant.



THIS IS TOP view of the new Jones hot top.



THIS IS BOTTOM view of the new Jones hot top.



ROLLED PRODUCTS from ingot cast with Jones hot top (at top) and from ingot cast with regular equipment (at bottom).



PRESSURE applied to staking CUTS ASSEMBLY REJECTS



by F. E. Miller

General Methods Section
Meter and Instrument Div.
General Electric Co.
Lynn, Mass.

Clock, instrument, timer and other such assemblies are being staked with hydraulic or air pressure, replacing the screw or bolt and nut as a fastening device. Hydraulic and air staking presses now in use cut costs and provide quieter, easier operation which lessens fatigue.

Development of staking procedures has followed a well-defined path. In the simplest attempts, a convenient holding device is held in a bench vise and the job staked with a conventional hand punch. The punch is placed and held with one hand while the blow is struck with a hammer.

When greater accuracy is desired, the holding device is fastened in a goose-neck casting. The punch is then guided by a hole bored in the boss comprising the head of the gooseneck. The punch is still hit with a hammer to provide staking pressure. The gooseneck fixture provides accuracy of line-up between the punch and the work, but variation in the hammer blow produces varying results in the staking.

This may be overcome by substitution of the drop weight for the hammer. The punch is extended a foot or more by attaching a vertical

rod on which is mounted a cylindrical weight and an adjustable stop. The cylinder is lifted until it contacts the stop and then released. By varying the weight of the cylinder and the location of the stop, fairly consistent results may be obtained.

The chief objections to this type of staking are fatigue of the operator where heavy weights are used or when short-cycle jobs are done. In short-cycle jobs, the operator needs to use the hands to operate the drop weight. When mechanical or pressure staking equipment is used, the hands are free to perform other elements of the job while the machine is doing the actual staking.

With the development of the mechanical press several old problems were partially solved, and two new ones created. The problem of fatigue is transferred from the arm to the

Pressure staking (continued)

lag which, theoretically, is better able to stand the strain. The hands are left free to perform useful work if desired during the machine cycle. Since the foot treadle merely operates the clutch release, there is, of course, no correlation between the amount of energy expended by the operator and the amount of energy used by the operation, as there is in the case of the punch and hammer or the drop-weight arrangement.

In the mechanical press, therefore, a fixed distance, even blow is delivered with each cycle of the press. The force of this blow is entirely out of the operator's control. In order to accomplish this feat, however, two things are done which definitely injure our chances of obtaining a good staking job.

In the first place, the punch is mounted in the ram of the press. Then, in order to develop the power necessary to do the job, the ram is cranked up and the punch brought down against the work with a blow. This involves a line-up problem not present in the previous staking methods. Even more serious is the fact that the sudden blow, instead of allowing the metal to deform along natural slip-plane movement lines and thus retain its normal tension, seems to fracture the deformed areas. In many cases it is possible to pick bits of fractured metal off with very little effort.

Since these nodes hold the staked parts in tension, the quality of such a job leaves much to be desired.

A major problem with the mechanical staking press is the matter of fixed distance travel of the ram v. accumulated tolerances in the product parts. Since the crank rotates on a fixed

axis, the punch is driven down to a definite distance from the anvil with each rotation. The setting of this distance is determined by the thickness of the product parts. In turn, this determines how far into the material the "teeth" of the punch will sink and, consequently, how much pressure will be built up against the work as the ram reaches the low point of its travel.

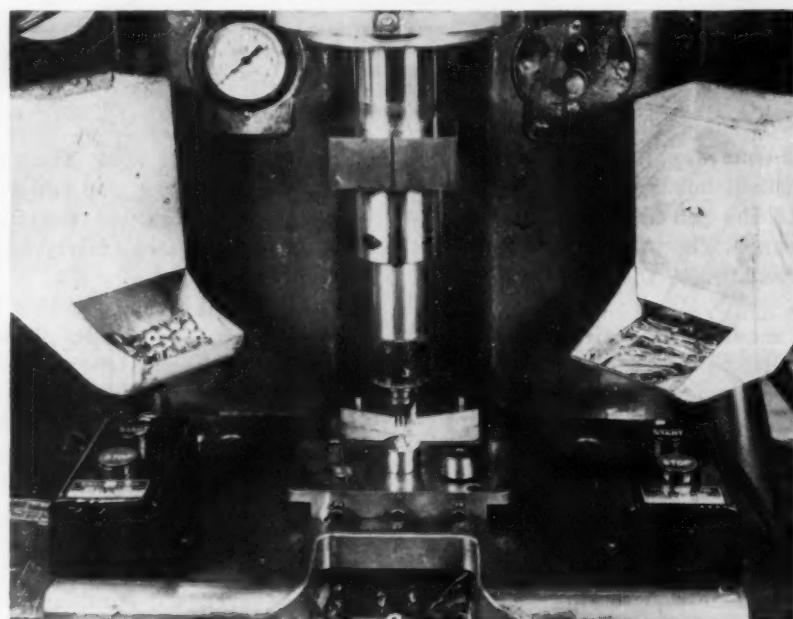
If a true median could be observed in the manufacture of the parts, a setting of the ram could be made which would aid in producing well-staked assemblies. However, allowable tolerances are a recognized factor in product design. This is particularly true of those parts produced in automatic-screw machines and the punch-press parts produced from rolled stock, the two types of products most concerned in staking.

Maximum tolerances cause trouble

It is easily recognized that when the accumulation of tolerance reaches the maximum, the pressure developed by the mechanical press is at a maximum. This is because the punch teeth must be driven deeper into the work to reach the distance from the anvil required by the ram setting. In many cases, where the parts are heavy enough, this does not harm the product. However, in light parts the possibility of distortion is considerable.

Harm results in far more cases, however, when the tolerance accumulation is minimum, for then loose staking results. Loose staking is the major cause of rejected assemblies when a mechanical press is used.

With the development of pressure-staking equipment at West Lynn, this problem has been solved. Where rejections for loose staking were



SETUP for manually operated hydraulic pressure staking.

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SEMI-AUTOMATIC operation of a hydraulic staking press is possible with a rotary table and hoppers such as these.

once a major item on scrap and salvage lists, they are now unimportant. When such scrap does occur, the finger of blame can usually be pointed directly at the cause of the difficulty—faulty parts, poor set-up or impaired tools.

This great improvement in staking quality is the direct result of doing away with the fixed distance, impact type of staking equipment. Hydraulic and pneumatic presses have been developed in a long range program at this plant.

A survey of the major staking jobs in the plant with respect to their pressure requirements revealed the necessity of providing equipment to cover an operating range of 100 to 8000-lb ram pressure. This range was too great to be covered by any one type of equipment. It was decided that equipment types should be studied and a series selected which could readily be used with standardized tooling. This was done, and three press types were accepted.

Adapters were built for each of the three types of presses so that tools would be interchangeable. This was done not only in the new equipment, but also in such old equipment as was still in use. This flexibility is not only of great value in proper machine-time utilization in the factory, but is helpful to the planning groups and the tool design section. The design of tools is standardized and would be the same regardless of what machine the tools are used in.

The presses selected in the development program are the 4-ton "Multipress," manufactured by the Denison Engineering Co., Columbus, Ohio, the 1-ton "Multipress Midget" made by

the same concern and the Mead Model 122 press, manufactured by the Mead Specialties Co., Chicago.

The Denison presses are oil-hydraulic. The 4-ton press consists of a C-type frame-reservoir in which is mounted a double acting cylinder, four-way control valve and the motor and pump unit. All piping is concealed within the frame. This press provides an operating range of 300 to 8000-lb ram pressure—the range within which the majority of staking jobs at West Lynn fall.

Both air and hydraulic pressure used

The 1-ton Denison press is similar to the 4-ton press, except that the pumping unit and reservoir are located outside the press frame. This press provides a pressure range of 200 to 2000-lb ram pressure. It is smaller, cheaper and slightly faster in operation than the 4-ton model.

The Mead press uses air pressure, operating in a pressure range of 100 to 900 lb. This press has a small air cylinder and ram mounted on a casting, which provides a work area as well as support for the cylinder. For accurate line-up, a goose-neck staking fixture was built into this press. The unit's tool holder is connected to the press ram by a toggle. Flexing of the casting under pressure has no effect on the punch and anvil lineup, which is very important in the small work assigned to this press. Action is much faster than in the hydraulic presses.

All these presses are similar in that initial operation of the control valve merely causes downward travel of the ram under no great pressure. As the punch contacts the work, downward travel is halted momentarily and pressure begins to build up in the cylinders. This continues until the elastic limit of the material is overcome and the metal is literally squeezed into the shape required by the contour of the punch.

Pressure preset and controlled

To eliminate any impact from the air press, the air on the free side of the piston is trapped by a swing check valve. Only the air which leaks out around the piston ram or through an adjustable needle valve can escape. This cushions the action, yet the swing check valve opens easily and allows quick return of the piston.

When the preset pressure level of the hydraulic system has been reached, the resistance of the work being equal to the ram pressure, no further deformation takes place. The system remains static until the control valve is shifted and the ram allowed to return to the up position. Pressure is preset and controlled in these hydraulic presses by means of a relief valve.

In the Mead press, a standard air-pressure regulator serves the same purpose. The impre-

Pressure staking (continued)

tant point here is that no pressure is built up until the work is contacted. Since this effect is the same at any point in the ram travel, vertical tolerances have no effect on the final outcome of the pressing act. In other words, the fixed-distance proposition which caused so much difficulty in the mechanical press has been eliminated.

The second major problem arising from the use of mechanical presses of the crank type involves safety. Elaborate precautions need to be taken to keep the operator's hands out of the staking area. Many successful arrangements have been devised which insure safety, but are viewed with distaste by manufacturers because they increase costs.

Latches, interlocking devices, hoods and other such arrangements are fine and will prevent accidents. But when a short cycle job of 2 to 3 sec is involved, the cost of operating such devices may easily be more than the cost of the productive operation itself. The problem is to devise an arrangement that does not compromise with safety at a cost which can be easily absorbed. The electronic control system used on the pressure staking equipment at West Lynn has done this.

Electrically, the control systems used on hydraulic and pneumatic staking equipment are the same. To commence the operation, the operator presses the two start buttons located at the sides of the press and immediately releases them. The hands may then start another element of the operation if desired.

Momentary contact of the two start buttons energizes a double-pole relay. One pole closes

the interlocking circuit, which makes it possible to release the buttons immediately. The other pole closes a circuit leading to the valve-actuating solenoid which shifts the valve spool, permitting the ram to descend. As the solenoid circuit is completed, a circuit to the vacuum-tube, time-delay relay starts operating. The delay relay has an external setting knob from which a time value has been selected to suit the particular job in question.

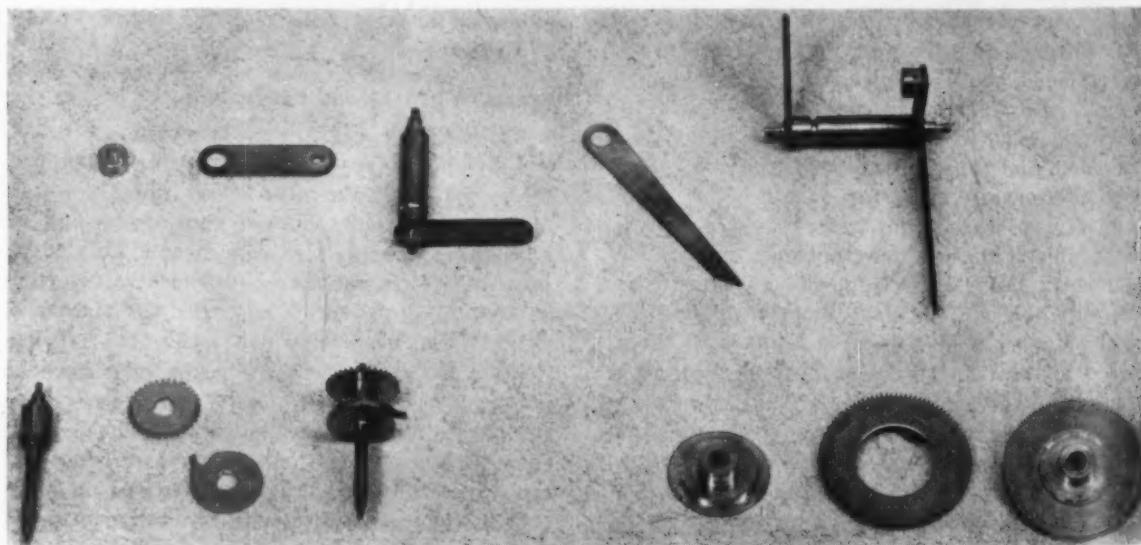
At the expiration of this pre-set time, an electro-magnet in the delay relay is energized and trips a normally closed micro-switch. This opens the other leg of the interlocking relay circuit, thus de-energizing it. The solenoid is then de-energized and permits upward travel of the ram. Breaking of the interlock prevents any further activity until the start buttons are again pressed.

Operator only starts cycle

Combined in the same stations with the black start buttons are red stop buttons. These break the interlock whenever one of them is depressed. They are used only as an emergency measure causing the ram to return before completion of the pre-set time cycle.

From a methods standpoint, the desirable feature of this control system is that the operator, except in an emergency, has no control of the operation other than to initiate the cycle. Upon pressing the black start buttons, the ram descends, the punch contacts the work, preset pressure builds up to perform the operation, the ram rises and the punch is withdrawn.

From a safety standpoint, the two hands are occupied in pressing the series-connected start buttons. By the time the hands have released control of the start buttons, the ram has com-



TYPICAL PRODUCTION parts staked in West Lynn plant. By looking at each assembly unit from left to right, it can easily be seen the type of jobs done and the staking procedure used in a hydraulic press.

pleted its down stroke and danger of injury has passed. It is, of course, essential that the button stations be mounted far enough apart so that the distance cannot be straddled with the fingers of one hand. Collars built around the buttons reduce the danger of the wrists, forearms, tools or equipment accidentally operating the press.

In the past it has always been considered that a hydraulic press would be much slower than the mechanical type. It was believed that the increased cost would be prohibitive. In all probability, this is why pressure staking has not been developed before. Experience proves conclusively that machine speed is no longer an important factor. Brackets to hold hoppers of parts in close proximity to the anvil, a cut-out in the bolster plate for drop-delivery and careful location of the operating controls have eliminated any unnecessary movements.

In setting wage-rate standards on jobs in these presses, very favorable comparisons have been made with standards on older types of

equipment. In a very few cases, the time has had to be increased; in many others it has been possible to set a lower standard.

The real savings and justification of the investment in this equipment is in the reduction of spoilage. Using the previous equipment, rejections ran from 5 pct to as high as 25 pct. Pressure staking has reduced this to less than 1 pct and, in many cases, to zero rejection.

There are, in addition, other factors less easily translated into dollars saved but still important. Not the least is quietness of operation. An operator used to working amidst the clatter of a bank of mechanical presses well appreciates the quiet hum of the pressure-staking equipment.

Ease of operation is a factor—the operator need only touch two buttons. Reduced maintenance of both tools and equipment are important. The obviously increased initial cost of this equipment might be considered a deterring factor. However, it has been shown how this investment can be liquidated by decreased scrap costs.

Pneumatic tube speeds metal analyses

Faster handling of the metal analyses for the casting department of Scovill Mfg. Co., Waterbury, Conn., has been made possible with installation of a 1000-ft-long pneumatic tube system. The tubes run between the casting shop and the research department and have eliminated the need for messengers.

Samples of each heat are sent from the casting shop to the metals research department and a report of the analysis on billets or bars is returned to the casting shop. About 2400 chemical or spectrographic determinations are made each day.

Formerly, a messenger carried samples and reports back and forth every hour. Now, samples are placed in an envelope, the envelope in a carrier, and the carrier in the dispatch tube. The carrier travels 25 ft per sec. From 100 to 200 tube trips are made per day and samples or messages can be dispatched at any time without waiting for messenger service.

The system, designed and installed by the Lamson Corp., is important in continuous casting operations. Rapid analysis and receipt of the analysis reports are necessary to maintain correct composition of the alloy and to enable necessary corrective measures to be taken to insure the casting of quality metal. Samples



FASTER SERVICE on metal analyses is possible with pneumatic tube which handles samples and laboratory reports. Tube replaces one messenger per shift.

are taken every half hour at the continuous casting machines and sent at once for analysis.

Three-hp compressors furnish the vacuum which draws the carriers through the tubes. Each of the two tubes is equipped with two compressors—one in operation, one as standby.

How to bandsaw BRONZES



By H. J. Chamberland

Research Engineer
The DoAll Co.
Des Plaines, Ill.

Until recent years, bandsawing of bronzes was limited to low speeds, and tool life was poor. New blades, machines, and techniques have improved this situation. The skip tooth sawband and line grinding with carbide bands are of particular importance in handling aluminum and manganese bronzes.

Before 1945 the bandsawing of bronzes was limited to low speed cutting. Tool life was extremely short even if a great sacrifice of cutting rate was made. However, the picture has changed for the better since that time with the introduction of new types of blading; more versatile, productive and simplified machines; and improved saw lubricating methods.

Today all bronze metals can be economically band machined. The fact that all bronze compositions are in short supply makes it doubly important to give the process prime consideration.

An outstanding development in bandsaw practice in late years has been the Contourmatic machine. This combines the requisites of individual low, high, and super high speed units, and can use at least two dozen different types of band tools to contour saw all materials industrially used at velocities of from 40 to 10,000 fpm. This is important in sawing the bronze metals since some types require the conventional precision band at low speed, other types the skip tooth band also at low speed, while the tougher grades are most economically friction sawed if permissible.

The silicon carbide band introduces a new technique known as line grinding, which is used with excellent results if the material thickness exceeds friction cutting limitations or else if a very fine finish of cut is desired.

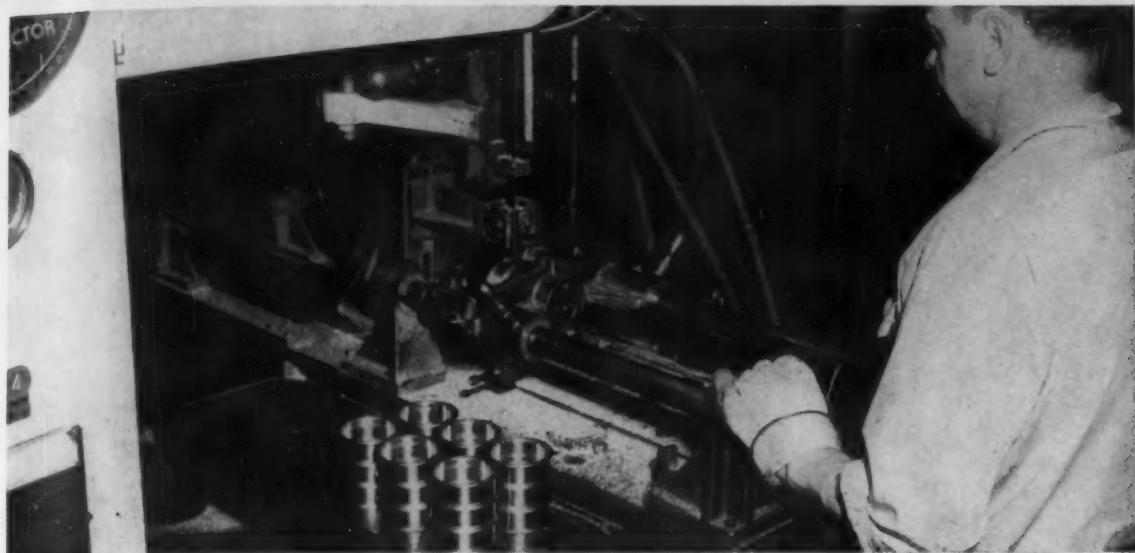
Manganese and aluminum bronzes are most

common and all new sawing techniques apply to these particular types or grades. The cutting of silicon bronze remains a problem; a cutting rate of from 6 to 14 sq in. per min is possible, all depending on the silicon content. For example, at a velocity of 300 fpm sections 2 in. thick on cast bronze having 4½ pct silicon can be cut at the rate of 6.6 sq in. per min with a saw life of 140 sq in. The less silicon the better the results.

Nickel bronze is also cut with a standard pitch band at varying low speeds according to material thickness, and so are some of the aluminum types such as Ampeo 8, 12, 16 and 18, all having a Bhn under 200.

Skip tooth band efficient

Prior to the development of the skip tooth sawband, bronzes, coppers and other non-ferrous metals were cut with standard pitch blades. While cutting rates were more or less satisfactory, tool life was not. The skip tooth band has proved a substantially more efficient tool than the standard for straight or contour sawing the manganese bronzes. In most cases previous cutting rates have been remarkably stepped up, but most significant has been an increase in tool life of as much as 90 pct. Regardless of the fact that most manganese bronzes are still bound to the low or conventional sawing range, velocity to approximately 1000 fpm, the new blade permits higher veloc-



PRODUCTION has increased 400 pct through use of this ingenious band machining setup for slitting graphite bronze bearings. Standard feed is used to feed work into the saw. Quick return of fixture is by compressed air.

TYPICAL SAWING RECOMMENDATIONS*

	Line Grinding	Friction Cutting
Saw type.....	Line grind band No. 80 grit silicon carbide	Standard precision
Saw temper.....		A
Saw set.....		0.05
Saw pitch.....	1 in. 5000 fpm	10 teeth per in.
Saw width.....		1 in.
Saw velocity.....	Cutting oil and water, 1:40 Light hand 0.10 sq in. per min	10,000 fpm None Heavy hand 0.35 sq in. per min
Lubricant.....		
Feed pressure.....		
Cutting rate.....		

* For material $\frac{5}{8}$ in. thick. Data obtained on DoAll Contour-matic machine.

ties than heretofore because of its cool cutting action. This has a tendency to improve finish and accuracy of cut to a marked degree.

Manganese bronze having, for example, 4 pct aluminum and 25 pct iron, can most economically be friction sawed if the thickness does not exceed $1\frac{1}{4}$ in. A cutting rate of 10 sq in. per min is possible with a standard pitch blade 1 in. wide, 10 pitch, and a very heavy and constant feeding pressure. Since friction sawing requires ultra high sawband velocities, it is important to utilize a sawband with maximum quality equally divided between flex life and

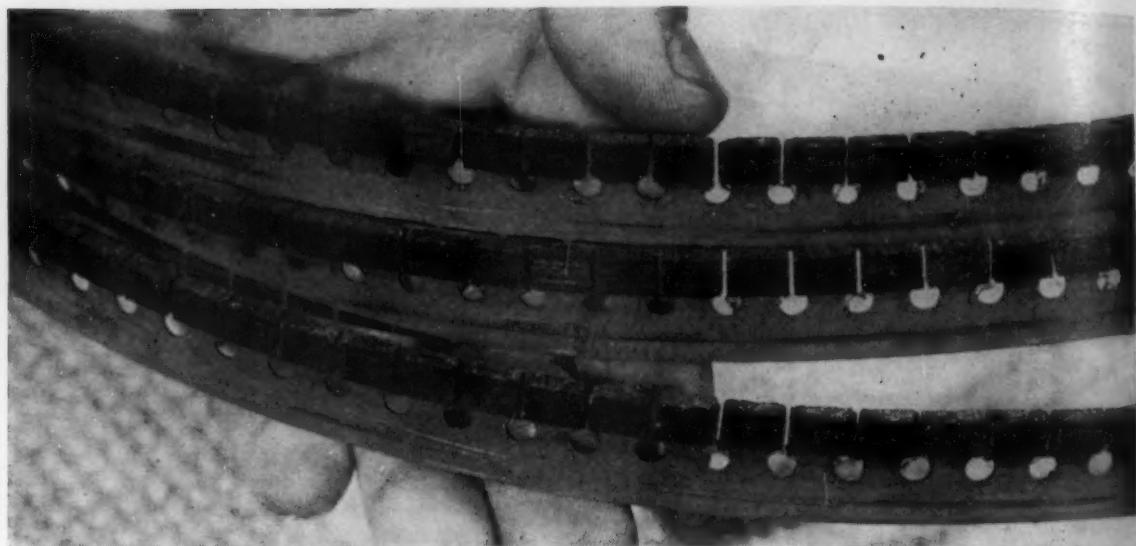


FRICITION SAWING $1\frac{1}{8}$ -in. riser section from a manganese bronze casting, with 25 pct iron content, at 10,000 fpm. The actual cutting rate is 14 sq in. per min. Saw used is a $\frac{5}{8}$ -in., 10-pitch band, on a DoAll machine.

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SILICON CARBIDE band for line grinding. These bands require operation at 5000 to 6000 fpm. They are also available in aluminum oxide for cutting hardened steel.

Bandsawing bronze (continued)

cutting edge wear resistance. Otherwise premature tooth failure or flex failure will greatly increase tool cost.

When cut at conventional speeds, the manganese bronze metals require cutting oil as a lubricant to be directed at the point of cut at approximately 50 drops per min. If the cut is substantially thick and the material is high in silicon and iron, the spray lubrication system is highly recommended. It is most economical if a mixture of 1 part of a high grade soluble oil to 20 parts of water is used. Typical cutting rates on manganese bronze with the skip tooth band are: 1 1/4 sq in. per min on 6-in. casting risers; 4.75 sq in. per min on 3-in. casting sections; 17 sq in. per min on 1 1/2-in. casting sections; 50 sq in. per min on a 3/8-in. section.

The cutting of aluminum bronze has been an industrial headache for some time. Of greatest concern to tool cost experts have been the toughest types such as Ampco 21, 22 and particularly 24 which has a Bhn of 352. Any of these grades can ruin a brand new saw in a matter of minutes when operated at conventional speeds. The friction band has no trouble penetrating a 1-in. section, but from here on

until very recently there was no choice but to make the better of low speed procedure and forget cutting costs.

The silicon carbide band has now come to the rescue and although it does not cut as fast as the friction band, it is nevertheless effective on thickness to 3 in. or more. Since it precision grinds rather than saws, the finish is better.

In 1945, Ampco 21 1 in. thick could be sawed at a conventional velocity of 250 fpm with a cutting rate of 8 sq in. per min; however, saw life was practically limited to 40 sq in. Today, the same grade and same thickness is friction cut at 12,000 fpm with a cutting rate of 14.5 sq in. per min and the band keeps on cutting for hours rather than minutes.

The friction sawing limitation on Ampco 24 is, however, 5/8 in. Beyond this thickness it is impossible to concentrate sufficient heat in front of the saw teeth for the process to be practical as well as economical. The inherent low machinability of Ampco 24 therefore leaves only two methods of band machining, line grinding and friction cutting.

Any material thickness exceeding 5/8 in. should definitely be line ground. A tool life of approximately 50 sq in. of cutting on this particular material is possible.

NEW BOOKS

Engineering Standards Multiple V-Belt Drives.

Recommended engineering standards for multiple V-Belt drives, developed and approved by the Rubber Mfrs. Assn. and the Multiple V-Belt Drive & Mechanical Transmission Assn. are presented. Sheaves, belts, key seats and

service factors applied to specific industries are considered. The manual will be of material assistance to the many power users who rely on multiple V-belt drives to keep production machinery running. The Rubber Mfrs. Assn., 444 Madison Ave., New York 22, N. Y. 50¢.



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FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER



KAYDON Tapered Roller Bearings 16.500" x 18.750" x 0.875"
with KAYDON Bronze Cages, silver plated, for high speed acceleration

Safe Way to Reduce Weight

Look again at this thin section bearing. KAYDON bearings like these, designed with very thin section, are a boon to design engineers who recognize weight-reduction and greater precision as prime problems today.

KAYDON Thin-Section Tapered Roller, Straight Roller, and Ball Bearings are helping solve such problems. All types can be made unusually light in weight, and permit

much more compact machine design.

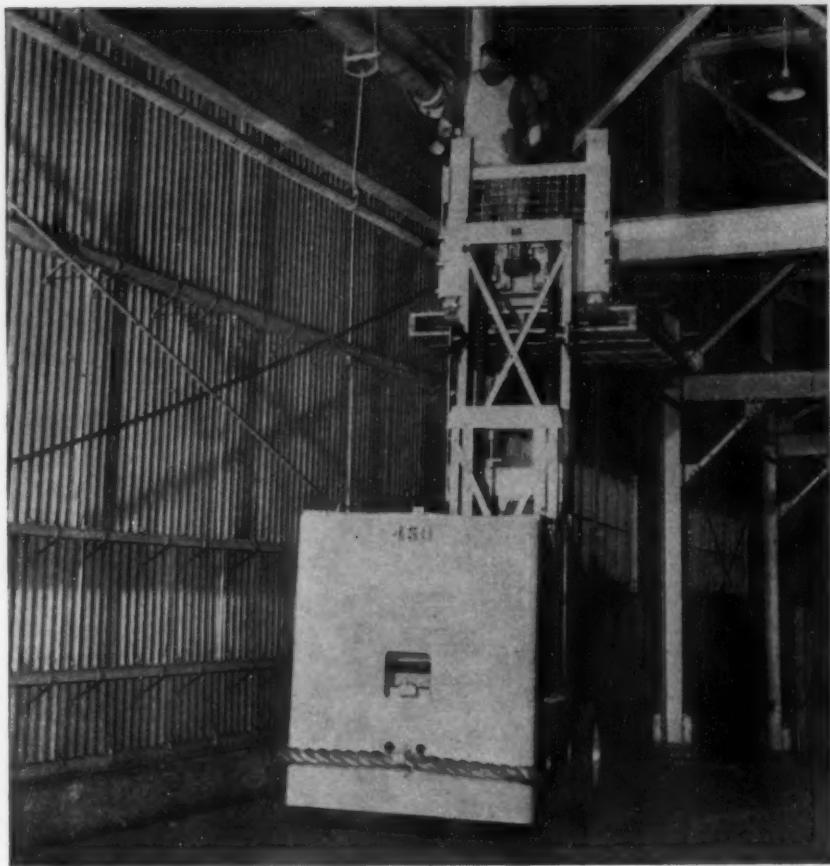
Unique high precision techniques that hold to closest tolerances in bearings as large as 120 inches outside diameter, assure consistent accuracy in all types and sizes of KAYDON bearings and needle rollers.

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For your precision bearing requirements, contact KAYDON of Muskegon.

KAYDON Types of Standard and Special Bearings:
Spherical Roller • Taper Roller • Ball Radial • Ball Thrust
• Roller Radial • Roller Thrust • Bi-Angular Bearings

THE **KAYDON** ENGINEERING CORP.
MUSKEGON, MICHIGAN
PRECISION BALL AND ROLLER BEARINGS



Material Handling plus Maintenance

This industrial truck, regularly employed for handling material in unit loads of 2000 to 4000 pounds, serves also to save time on many kinds of plant-maintenance jobs.

It is powered by a 28-cell D8 EDISON Nickel-Iron-Alkaline Storage Battery assembled in a demountable steel box, rated capacity 20.16 kWhr, which has been found ample for full-shift truck operation. Exchanging batteries at the end of one shift, gives the truck operating power for the next shift.

The battery is charged from current produced wholesale by a central station—the lowest cost power obtainable. In combination with a high-torque electric motor, it gives the truck an instant flow of power for starting and acceleration, yet is instantly and completely off during the many momentary pauses between the forward,

back, up, down, and tilting motions of the truck while engaged in picking up, carrying, tiering and setting down loads.

The electric-motor drive is just as dependable and trouble-free as in stationary-machine drives. The battery, its cells made of steel, its alkaline electrolyte a preservative of steel, its principle of operation foolproof, is the longest-lived, most trouble-free of all types of storage batteries. Send for our bulletin *Modern Material Handling* for more information on the advantages of the unit-load method of handling material, the power requirements of industrial trucks and the characteristics of EDISON batteries. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. Thomas A. Edison of Canada, Limited, Montreal.



YOU CAN ALWAYS RELY ON
EDISON
Nickel • Iron • Alkaline
STORAGE BATTERIES

Free Publications

Continued

Corrosion preventives

The ACP Quick Reference List of rust-proofing, paint-bonding and metal protective chemicals has for its theme—metal preservation and paint protection. Described are chemicals and processes for treatment of aluminum, brass, copper and copper alloys, steels and magnesium. *American Chemical Paint Co.*

For free copy insert No. 14 on postcard p. 119.

Machine tools

A new 16-p. catalog describes manufacturing facilities of one of the largest machine tool makers in Europe, the Herbert organization. The company produces a wide variety of high-production automatic and semi-automatic lathes, milling machines and drill presses. *Alfred Herbert, Ltd.*

For free copy insert No. 15 on postcard p. 119.

Piling for rent

Advantages of renting steel sheet piling are described in a new 8-p. brochure. Specifications for the interlocking piling sections, as well as corners and connections, of the three leading manufacturers of steel sheet piling are presented. Foster pile hammers and extractors are described. *L. B. Foster Co.*

For free copy insert No. 16 on postcard p. 119.

Auger bits

A new bulletin describes the complete line of Midway auger bits. Bits in mirror-bright finish are available in 17 sizes from 4/16 to 24/16 in. Also described are packed sets for farm and industrial use. *Midway Tool Co., Inc.*

For free copy insert No. 17 on postcard p. 119.

Presses

Heavy-duty presses for basic industry fabricating problems are described in a series of Hasenclever picture sheets. Forging, drawing and forming operations are possible with equipment ranging from less than 100 to more than 1000 tons capacity. *Maschinenfabrik Hasenclever A.K.*

For free copy insert No. 18 on postcard p. 119.

NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 119 or 120.

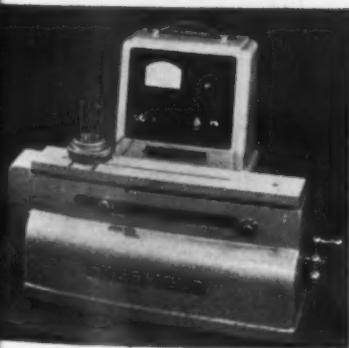


Taps same-size holes on one or more levels

Precision tapping of a number of same-size holes on one or more levels in bulky pieces is facilitated by a new compound-table tapping machine. Moving freely on ball-bearing raceways, the 28x42-in. work table has a lateral travel of 20 in. to either side, 13 in. forward travel and 11 in. backward travel from the normal standard position. This makes it possible to center any hole in a 24x40-in. workpiece directly under the tap. A pushbutton controlled solenoid brake locks the table in any transverse and longi-

tudinal position and holds it until released by pushing another button. A motor-operated raising and lowering system, controlled by up and down levers, gives the table 18 in. vertical travel, with table top 56 in. from floor at maximum height. Cycling is manual or automatic and limit switches are provided for tapping blind holes. The machines tap holes $\frac{3}{8}$ to $2\frac{3}{4}$ in., National Coarse Thread, in mild steel. Stroke is adjustable to 5 in. *Cleveland Tapping Machine Co.*

For more data insert No. 19 on postcard, p. 119

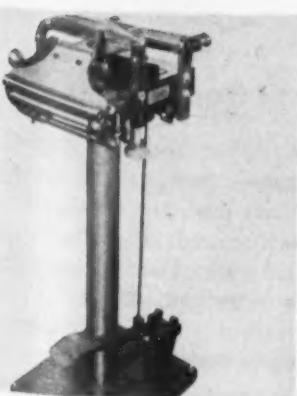


Gage checks one or more internal dimensions

Equipped with the N-6 Internal-chek, a new remote electronic gaging head has dual amplifications of 1000/2000, 300/3000, 5000/10,000 to 1. The instrument is used in the toolroom or gage laboratory for checking master and working ring gages, setting snap and length gages, for checking tools and other high precision work having one or more dimensions, for use where

small runs are made of a great variety of bore sizes which have close tolerances. Precision blocks or masters are used as a reference in setting up the instrument. The head consists of an ac vacuum tube circuit that gives indication on a high speed meter. Gaging range is from 0.370 to 12 in. diam; max gaging depth is $1\frac{1}{2}$ in. *Sheffield Corp.*

For more data insert No. 20 on postcard, p. 119



Dies and intricate tooling eliminated

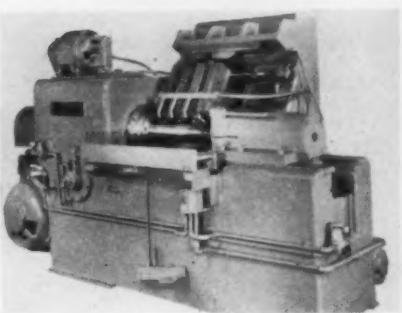
Capacity to bend 15 in. of 18 gage mild steel or equivalent is claimed for a new model Bendit metal forming machine. Developed for short run production work, Bendit forms any desired radius from $1/32$ to $5/8$ in.; makes boxes to 15x15x5 in.; handles low ductile materials, plated or painted metals without fracture or injury to the surface where radius of bend is large enough to

avoid cracking the paint. Bends of any angle, including complete folds, and partial bends can be made. Positive stops and gages permit accurate duplicating. Interchangeable bending blades of soft steel are supplied. Actual bending is done by steel roller. *Kilham Engineering, Inc.*

For more data insert No. 21 on postcard, p. 119

Turn Page

New Equipment

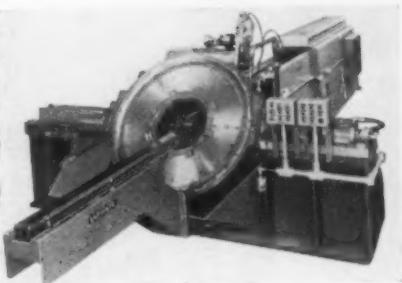


Shell lathe handles 75 to 240 mm shells

Three machine operations are performed on the new shell lathe: cutoff the open end to proper length and face the base, rough turn, and finish turn. The machine consists of a bed with an integral headstock, a separate tailstock, and a separate tool slide and cam unit. Tools for the cutoff and facing operations are

fed by rotating cams driven by a gear train from the spindle through change gears. Tools for the turning operations are fed into the shell as the cam rollers move along the overhead cams. Roller conveyor and loading rails assist in handling the shells. *Wm. K. Stamets Co.*

For more data insert No. 22 on postcard, p. 119

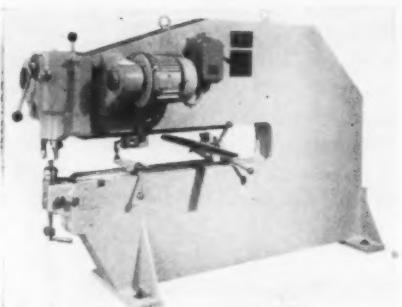


New fixture for broaching stator rings

Broaching stator rings for locomotive gas turbine engines or stationary power plants is facilitated by a new fixture mounted on a horizontal Lapointe broaching machine. The device accommodates all sizes of stator rings from 38 to 48 in. diam, and makes possible the

broaching of 40 to 1000 slots in the rings at a production speed of 35 sec per slot. It is built with adjustable travel of 15 in., hydraulic index, hydraulic plunger, and fully automatic lubrication. *Lapointe Machine Tool Co.*

For more data insert No. 23 on postcard, p. 119

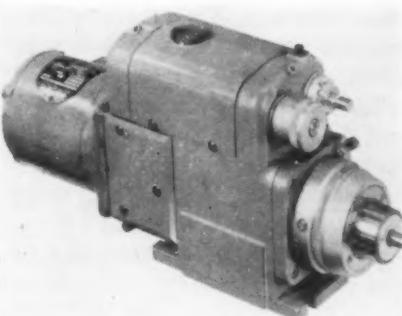


Pullmax has increased throat clearance

Due to increase in clearance, the new 9/32-in. capacity Pullmax machine is equipped with longer cutting tools which will give longer life to the tools. Quick locking devices are on the circle and straight cutting attachments, enabling the operator to set up much faster as no tools or wrenches are required.

The lower guide rail is graduated in inches to speed setting up time when cutting circles or squares. All moving parts are enclosed and operate in an oil bath. Throat depth of the Model D-3 is 48 in. to clear large steel sheets. *American Pullmax Co. Inc.*

For more data insert No. 24 on postcard, p. 119

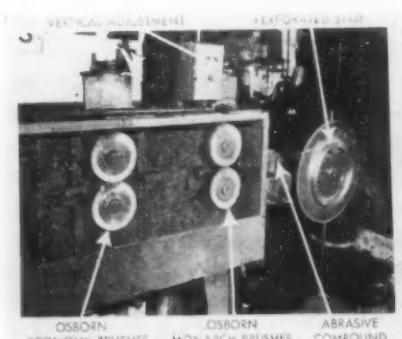


Drill unit designed for high production work

The Delta 19-150 air hydraulic drill unit is a basic unit adaptable to special machines for high production drilling, reaming, tapping, chamfering, spot facing, centering. Because of their infinite speeds which eliminate the need for cams, the units can be quickly adjusted to suit the requirements needed for

each operation. Controls for feed, length of rapid traverse, and final depth are grouped at front of the unit and are all infinitely variable for their entire range. Sealed construction permits operation in any position without change. *Delta Power Tool Div., Rockwell Mfg. Co.*

For more data insert No. 25 on postcard, p. 119



Power brushes do two jobs; effect savings

Removing heat treat scale and preparing strip surface of cutting tools for name etching can be accomplished on a two station automatic brushing machine that does both operations simultaneously. The cutting tool strip is pulled through the Osborn brushes at 50 fpm. Brushes rotate at 3450 rpm.

As they become grooved from wear, they are reversed. Bevel gears move the brushes up or down as required. These two stations do the work of six stations of the former method. The strip comes out uniformly clean and micro-smooth ready for etching. *Osborn Mfg. Co.*

For more data insert No. 26 on postcard, p. 119

New Equipment

Continued

Carbon determinator

With the CD-10 conductometric carbon determinator, only 5 to 10 min analysis time is required to analyze most types of iron and steel. A sample is combusted in oxygen and the amount of carbon dioxide resulting is established by measuring the change in conductivity of a barium hydroxide solution through which the carbon dioxide is passed. The CD-10 has a range of 0-0.035 pct carbon based on a 1 g sample, and a sensitivity of about 0.0002 pct. It is easy to operate and if simple precautions are observed can be held in standby condition for weeks. *Laboratory Equipment Corp.*

For more data insert No. 27 on postcard, p. 119

Form-a-jig compound

A new plastic cement compound, Form-A-Jig, holds broken sections for greater welding speed and convenience. It will not deform, move, or swell during welding operations; will not soil metal; mar the surface, or corrode. *Eutectic Welding Alloys Corp.*

For more data insert No. 28 on postcard, p. 119

Copper savings

A new resistance welding electrode, called Kaptrode, consists of an expendable cap which fits into a semi-permanent adapter shank. This in turn fits into any standard Morse taper type electrode holder. Depending upon the length of the adapter shank, copper savings up to 75 pct are possible. Kaptrode electrodes are made in six nose styles, in three RWMA alloys, and two Morse taper sizes. *Weiger Weed & Co.*

For more data insert No. 29 on postcard, p. 119

Waterless hand cleaner

When rubbed on the skin, a new hand cleaner turns to a liquid and literally melts the dirt away. Skin-Cote contains a good solvent, buffered by emollient oils, petrolatum and soothing lanolin to protect the skin. *Boyer-Campbell Co.*

For more data insert No. 30 on postcard, p. 119

Turn Page

October 18, 1951



Typical Example
of
Signode Leadership

AUTOMATIC POWER STRAPPING!

If you have never seen a Signode Power Strapping Machine in action, this may seem hard to believe!

This mechanical device . . . with but the slightest guidance . . . draws steel strapping from a reel, loops it completely around a package or bundle, brings it to just the right tension, and then seals and severs the strap . . . at speeds up to 500 completed operations per hour . . . on such widely varying products as cartons of cigarettes and coils of wire.

Developed to meet the needs of mass production shippers, the Signode Power Strapping Machine, in one or another of its variations, has opened up a whole new avenue of profit possibilities for manufacturers of millwork, flooring, steel, canned food, plastic sheeting, automotive parts and scores of other products. It is one of the more recent, in a long list of contributions, which Signode has made to better packaging and shipping.

If you are engaged in defense or essential civilian production, we'd like to tell you more about Signode steel strapping, strapping tools and methods. Write . . .

SIGNODE STEEL STRAPPING COMPANY
2623 NORTH WESTERN AVENUE

CHICAGO 47, ILLINOIS

this seal means security in shipping

Offices Coast to Coast
In Canada: Canadian Steel Strapping Co., Ltd.
Foreign Subsidiaries and Distributors World Wide

New Equipment

Continued

Self-priming pump

New self-priming motorpumps are intended for pumping applications under suction lift where the presence of air or vapor makes it impractical to use the conventional centrifugal pumps. They are used in process and bulk station applications, for mine drainage, bilge pumping, sump draining and irrigation service. Repriming is handled by means of recirculating liquid trapped in the casing. Sizes range from $\frac{1}{4}$ to 25 hp, with capacities to 800 gpm and a head up to 180 ft. Standard models utilize cast iron casings with bronze impeller and are driven by NEMA motors. These self-primers are available as complete motor driven units or mounted on ball bearing cradles to be driven through a coupling by a motor, engine, turbine. *Ingersoll Rand Co.*

For more data insert No. 31 on postcard, p. 119



Plenty of finger room

Redesigned with a new handle shaped for plenty of finger room, the new Holgun is rated for heavy-duty, continuous production service. Holgun is an end handle unit and is available for standard speed or low speed. Compact in design and weighing $3\frac{1}{4}$ lb, it is especially useful in close-corner drilling and for long hours of continuous operation because of its low fatigue factor. It is powered with a B&D universal motor, for 115 or 220 v power lines. *Black & Decker Mfg. Co.*

For more data insert No. 32 on postcard, p. 119

Turn Page

THE IRON AGE

SELECTOR SWITCHES PROVIDE CHOICE OF THESE MAXIMUM CAPACITIES AND CORRESPONDING SPEEDS

SINGLE ACTION		DOUBLE ACTION	
MAXIMUM CAPACITY (Tons)	SPEED (Inches per minute)	(Figures refer to inner slide only. Blankholder maximum capacity 500 tons in all cases.)	
		MAXIMUM CAPACITY (Tons)	SPEED (Inches per minute)
333	264	333	264
667	132	667	132
833	104		
1000	88	1000	88
1167	75		
1500	58		

Quick approach and return—400 inches per minute.



SPECIALIST in VARIETY

Most Clearing presses are built to do some special job with maximum production efficiency and thus at minimum cost per piece. But when the customer's requirement is for a press of wide utility, to take a great variety of work, Clearing still comes up with the right answer.

This hydraulic press can handle a draw of 30" with ample space for lift out. Yet when the work is shallow, it has a minimum shut-height of only 20". All of its 1500 tons capacity can be applied as a single action press, but movement of a few selector switches and removal of brackets makes it a double action machine with a 500 ton blankholder and 1000 ton punch. No slide bolster is necessary. Capacity can be reduced to as little as 333 tons with corresponding increase in pressing speed, and changed back again, with electric switches.

Quick, easy adjustment from one kind of work to another makes this specialist in variety a practical, economical answer to short run or jobbing problems. Ask us to show you how this press, or a different sized variation of it, can fit your requirements.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS



CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

"dag" Colloidal Graphite Lubricates at the Temperature of Molten Metal

"dag" colloidal graphite dispersions have an almost unlimited resistance to heat. At 500° F. where ordinary lubricants begin to gum up and fail . . . and even up to 5000° F. in inert atmospheres . . . "dag" dispersions overcome friction and keep parts lubricated for action.

In deep piercing operations, the use of "dag" dispersions means a smooth product, and reduced die damage. Scaling and sticking are minimized in forging. Tearing and rippling are reduced in stretch-forming. In wire-drawing, diameters are truly uniform, and die life is greatly extended. In casting, parting is easier . . . surfaces smoother.

Colloidal graphite is a solid lubricant, softer than talc. Its tiny tile-like particles slip on one another with amazingly little friction as a result of the particular arrangement of their atoms. The film formed by an application of colloidal graphite is microscopically thin, but far more durable than lubricating oil films. It is not subject to rupture except under conditions of heavy prolonged abrasion.

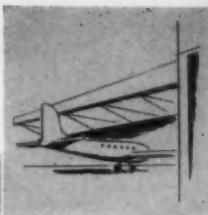
An interesting brochure on "dag" Colloidal Graphite for all Metalworking Operations is yours for the asking. Write today for Bulletin 426-13K

dag
DISPERSIONS®

Acheson Colloids Corporation, Port Huron, Michigan

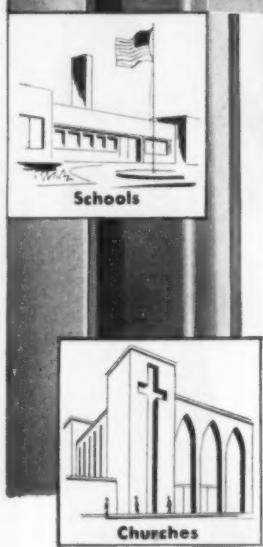
... also Acheson Colloids Limited, London, England

"Steel Permits Streamlining
Construction with Safety,
Endurance and Economy."

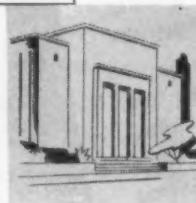


Airplane Hangars

Streamlined Bridges



Public Buildings



Office Buildings



Industrial Plants



Fort Pitt BRIDGE WORKS

Member American Institute of Steel Construction

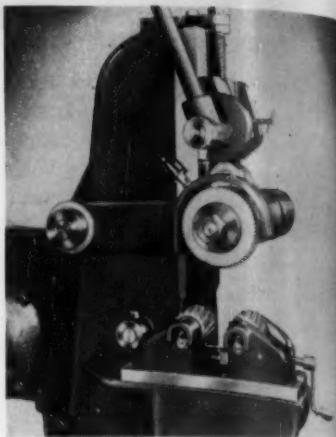
General Offices, Pittsburgh, Pa. . . . Plant at Canonsburg, Pa.

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—New Equipment—

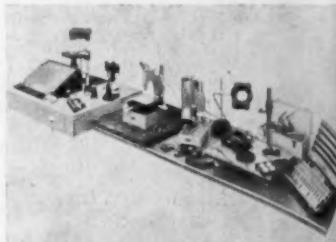
Continued



Pipe, tube de-scaler

A de-scaler and cleaning attachment cleans rust, scale, paint and other deposits off pipes, posts and building columns. Sizes are available for cleaning pipes up to 12-in. diam. It is especially adapted for reclaiming used pipes and tubes. Most work requires only one pass through the rollers to remove all deposits. The attachment feeds up to 20 ft of pipe per minute. Continental Machine Co.

For more data insert No. 33 on postcard, p. 11



Inspection lab

An assortment of measuring tools and instruments that are capable of performing all ordinary operations to measure and inspect thickness, length, diameters, forms of tools, templates and dies, pitch lead and form of screw threads, visual inspection of finish, circular dimensions and graduations meets most government inspection regulation for contractors of aircraft and associated equipment. The assortment has been named the Scherr Limited Budget Laboratory. Gen. Scherr Co., Inc.

For more data insert No. 34 on postcard, p. 11

Turn Page

Now... ARC-DRIVE CONTROL for D-C Rectifier Welder



- ...INSTANTANEOUS RESPONSE TO ARC-LOAD CHANGES
- ...INSTANTANEOUS RECOVERY
- ...REDUCED ARC BLOW
- ...COMPLETELY ADJUSTABLE BY OPERATOR

Westinghouse RA Welders with new positive arc-drive control now prevent shorting when used on "drag" welding applications. In addition, they allow complete penetration on root passes of vertical and overhead welds. Arc-drive control is obtained by adjusting the ratio of short-circuit current to welding current without changing open-circuit voltage. Actual amount of arc-drive current can be varied by the operator.

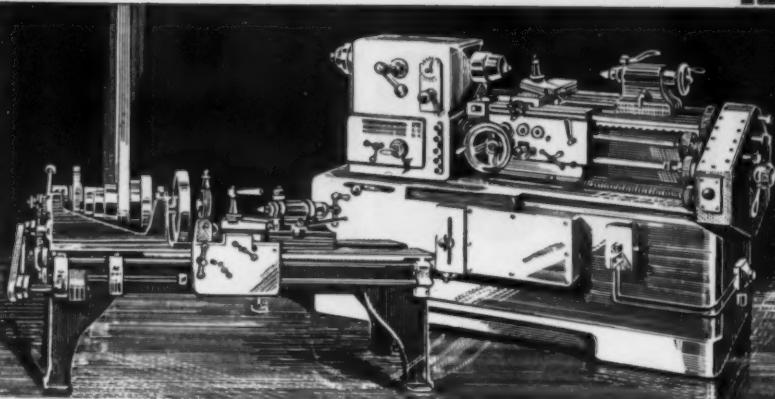
For information on this improved RA Welder or other Westinghouse Welding Equipment, write Westinghouse Electric Corporation, Dept. DC72, Welding Division, Buffalo, New York.

J-21607



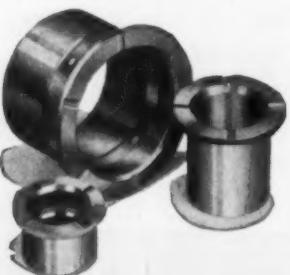
JOHNSON BEARINGS

1901-1951



Getting Today's Higher Speeds Required Progress in Sleeve Bearings

The advanced engineering of modern machine tools was made possible by the improvement of materials and production methods for the many component parts. Johnson Sleeve Bearings are examples of this fifty years of progress . . . new bearing styles, improved design, refined alloys, new materials, and greater precision. Most of the Johnson Bearings of today show only superficial resemblance to the bronze castings and heavily babbitted bearings of fifty years ago. The wide experience and "know-how", accumulated over the years by working with manufacturers in all fields, probably can be helpful to you. Johnson engineers will gladly study your requirements and make recommendations on the types and designs of bearings needed. Write, wire or phone for an appointment.



SLEEVE BEARING HEADQUARTERS Since 1901

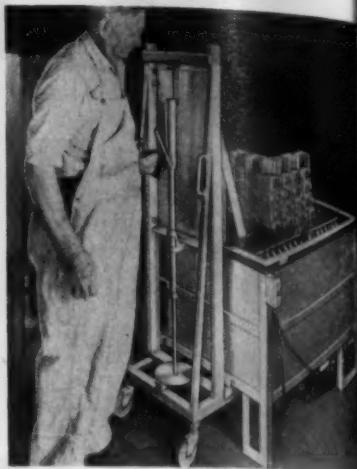


Johnson Bronze

505 SOUTH MILL STREET • NEW CASTLE, PA.

New Equipment

Continued



Quench tank

Designed to receive work from a mechanical loader which removes the entire load from the furnace and quenches it in one easy operation, a Contro-Therm quench tank cools as it circulates the quenching liquid. The tank maintains a constant level regardless of the displacement caused by treated work. As the load is lowered into the tank, the overflow runs into a reserve section from which it is constantly circulated back into the main part of the tank, aerated and cooled to insure a uniform quench. Directional flow can be changed at will. Quench tank measures 30 in. wide x 42 in. long x 30 in. deep. A. D. Alpine Co.

For more data insert No. 35 on postcard, p. 119

New brightener

Primary functions of Silver Speed brightener and Silver Speed conducting salts are not limited to new bath solutions alone. They also convert old solutions into baths which are new, giving them speed and brightness at low cost. Used in conjunction with Silver Speed reagent, the new brightener is said to produce brighter deposits. Use of the conducting salts is said to eliminate burning and to permit the use of current densities heretofore not possible. Conducting salts can be used in conjunction with the brightener or alone with the reagent; or for maximum effect all three may be used together. Enley Products, Inc.

For more data insert No. 36 on postcard, p. 119

Turn Page

New Equipment

Continued

Anti-rust paint

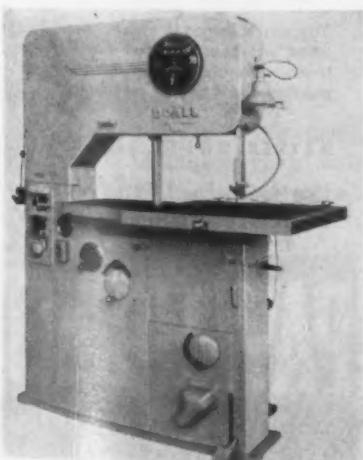
Rust-Cure, a new labor-saving anti-rust paint, can be applied right over rust without wire-brushing, scraping or sandblasting. Available in black, aluminum and clear, it is suitable for both interior and exterior use on either old or new metal. It is said to penetrate through any existent rust layer and effectively seal the surface against further rust action. Rust-Cure is compounded for brush application and may be thinned with solvent for spray use. Monroe Co., Inc.

For more data insert No. 37 on postcard, p. 119

Variable tool velocity

A new general purpose contour sawing machine takes continuous saw, file or abrasive bands up to $1\frac{1}{2}$ in. wide. It features a three-speed transmission and speedmaster drive providing variable tool velocity ranging from 25 to 6000 fpm. With this speed range it performs all types of conventional metal sawing or filing, high speed cutting of nonferrous metal and composition materials and light gage alloy friction cutting. Its 36-in. throat capacity makes it useful and economical in aircraft production, sheet metal, pattern and sign shops. Variable tool speeds and feed pressures are controlled and correlated by handwheels convenient to the operator. DoAll Co.

For more data insert No. 38 on postcard, p. 119



Turn Page

October 18, 1951

Just Part of ONE
BIG HARDWORKING FAMILY

for INCREASED PRODUCTION!
LESS TOOL COST!
GREATER ACCURACY!

W-S LATHE BITS

W-S REAMERS

W-S END MILLS

W-S TWIST DRILLS

W-S COUNTERBORES

W-S LATHE CENTERS

W-S TOOL BITS, MILLED AND BRAZED

W-S SHELL END MILLS

THE MOST COMPLETE LINE OF CARBIDE CUTTING TOOLS

Choose from a complete range of sizes . . . wide selection of styles . . . straight or taper shanks. Quick delivery on all W-S tools from your nearest Wendt-Sonis distributor.

FREE!

SEND TODAY for CARBIDE EQUIVALENT CHART, showing carbide manufacturers' grade recommendations.

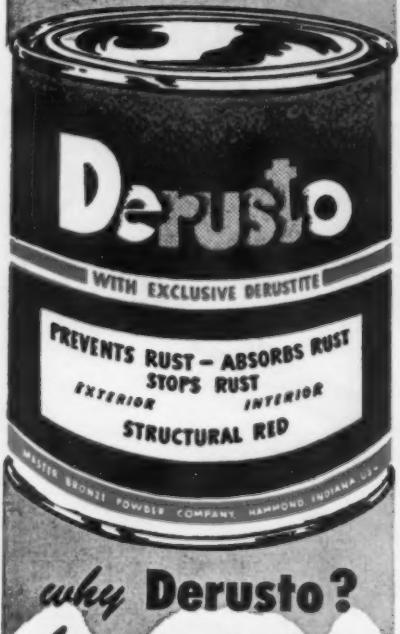
WENDT SONIS

Hannibal, Missouri

CARBIDE TIPPED CUTTING TOOLS

BORING TOOLS • CENTERS • COUNTERBORES • SPOTFACERS
CUT-OFF TOOLS • DRILLS • END MILLS • FLY CUTTERS
TOOL BITS • MILLING CUTTERS • REAMERS • ROLLER
TURNING TOOLS • SPECIAL TOOLS

For **MAXIMUM PROTECTION** on all **METAL SURFACES...**



*why Derusto?
because Derusto*

PREVENTS RUST

**STOPS
RUST**

DERUSTO has successfully passed all tests given by the Pittsburgh Testing Laboratory.

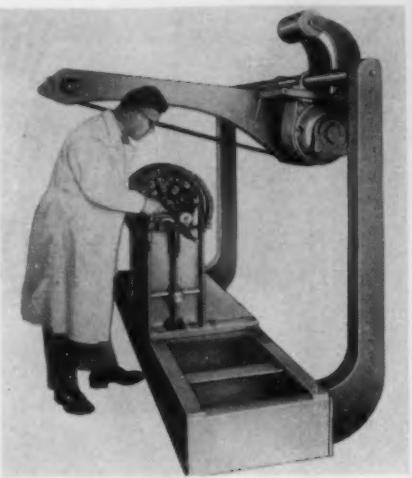
DERUSTO comes in standard industrial colors . . . ready for spraying, brushing, or dipping.

For **FREE SAMPLE** and further information on the Pittsburgh Laboratory tests, write

**MASTER BRONZE
POWDER COMPANY**
5009 CALUMET AVE.
HAMMOND, INDIANA

New Equipment

Continued



Dynamic balancer

The Wagner universal dynamic balancer provides a simple method of putting armatures, rotors, pulleys, flywheels, gears, hubs, drums in true dynamic balance. Parts are placed on the balancer with shafts resting on ball-bearing rollers and rotated to determine the position of dynamic unbalance so that corrective weights can be added. The machine will balance equipment up to 48 in. diam, 4000 lb, and 80 in. between vertical standards. *Industrial Engineering Equipment Co.*

For more data insert No. 39 on postcard, p. 119

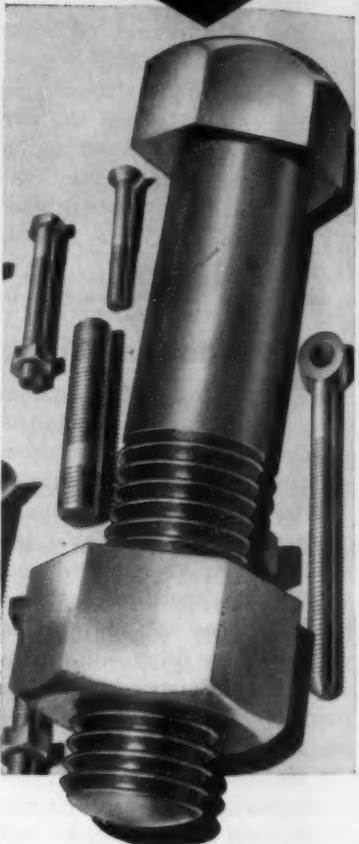


Joining pipe to sheet

Collar edging rolls prepare a round sheet metal pipe for joining with a flat sheet. The contour of the rolls raises a substantial bead above the surface of the pipe and at the same time crimps the edge making it smaller than the pipe diameter. The crimped edge can easily be peened over to form a tight joint with the sheet. *Niagara Machine & Tool Works.*

For more data insert No. 40 on postcard, p. 119

First for
**BOLTS
NUTS
STUDS**



- ★ Carbon Steel
- ★ Stainless Steel
- ★ Heat-treated
- ★ Silicon Bronze
- Alloy Steels
- ★ Naval Brass
- ★ Monel Metal

You can count on a uniform Class 3 Fit when you buy Pawtucket threaded fasteners. Accurately made in standard dimensions — or to your specifications.

BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners for Economy and Reliability

PAWTUCKET
"THE BOLT MAN"
MANUFACTURING COMPANY
327 Pine Street Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

Technical Briefs

Screw Standards:

Revised edition of American Standard now available . . .

A revised edition of the American Standard for Screw Thread Gages to Gaging has been approved by the American Standards Assn.

This edition brings up-to-date the methods for checking threaded products against requirements for Unified and American Screw Threads for Screws, Bolts, Nuts and Other Threaded Parts, Bl.1-1949. The Unified Threads were approved in 1949 by Great Britain, Canada, and the United States.

The new standard contains tables for W and X tolerances on lead, half angle of thread; major, minor, and pitch diameter; and wear allowances on pitch diameter, for GO, HI, and LO thread gages, and Z tolerances for plain plug gages for checking the minor diameter of internal threads and the major diameter of external threads.

The terms "HI gage" and "LO gage" are now applied to the gages previously called "NOT GO gages" and used for checking external and internal threads, respectively.

The W tolerances represent the highest commercial grade of accuracy and the X tolerances, which are larger, are an economic compromise between gage cost and required accuracy in use.

Copies of the American Screw Thread Gages and Gaging, Bl.2-1951, may be obtained from the American Standards Assn., 70 East 45 St., New York 17, N. Y., at \$4.00 per copy.

Axial Compressor Described

Use of axial compressors in large blast furnaces in place of the standard centrifugal blower may permit savings of over \$20,000 per unit in cost of steam alone, W. O. Lowell, of Allis-Chalmers, told the operating practice session of the Assn. of Iron & Steel Engineers, recently.

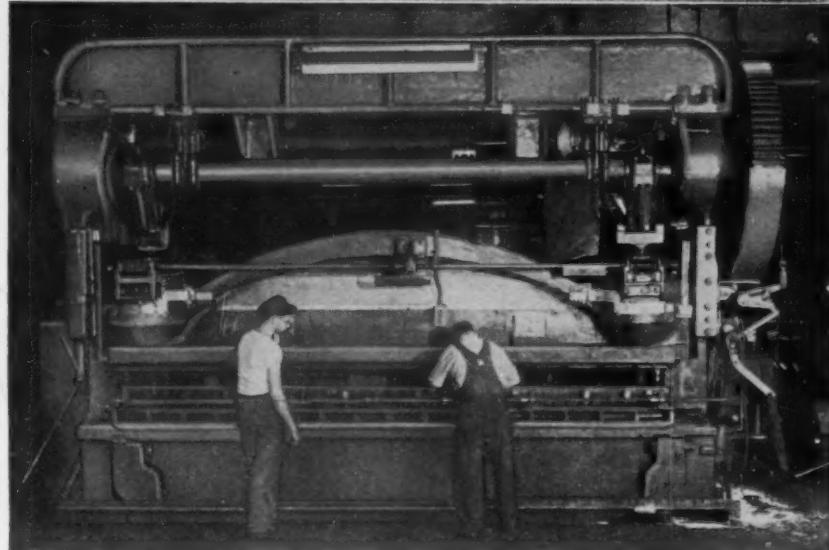
The axial compressor unit is capable of providing an overall efficiency improvement of up to 16 per cent over a comparable centrifugal blower unit in the larger ratings.

The compressor is smaller, lighter

Where Quality Counts . . . in the TOOLS OF PRODUCTION



MINNEAPOLIS-MOLINE
A Valued Customer of
WILLIAMS-WHITE & CO.
Since 1880



QUALITY in the tools of production results in long service, efficiency and economy in products for the home, the farm and for National Defense.

This large press is one of many WILLIAMS-WHITE machines in daily production at MINNEAPOLIS-MOLINE. Here, it is being set up to run a quantity of angle bars used in the header of the M-M G-4 Harvester, shown above.

Getting scrap metal off the farm is a Safety Measure

MAKERS OF QUALITY PRODUCTION TOOLS FOR NEARLY 100 YEARS

WILLIAMS-WHITE & CO.

703 THIRD AVE., MOLINE, ILLINOIS

—Technical Briefs—

and operates at higher speed. An adjustable blade permits some modification of rating after installation. Individually mounted blades can be replaced in the field. The compressor can be built for much larger ratings than would be feasible with the centrifugal blower.

Research:

AES Research programs reviewed by Donald Price . . . Work aids platers

Results of AES research programs should be evaluated on the basis of improved methods and processes, or basic information which will aid in electroplating work, Donald Price, director of research, Oakite Products, Inc., recently told members of the American Electroplaters' Society.

Active research projects of the AES were reviewed by Mr. Price.

Project No. 9, "The Physical Properties of Electrodeposited Metals" has extended over a period of 4 years.

Approximately 500 nickel deposits, about 0.01 in. thick, in sheet and tube form, were produced from 19 different bath compositions. Important physical properties were determined for most of the deposits.

Data on the most important properties of 236 nickel deposits have been assembled.

Under Project No. 6 devoted to study of the "Nature and Effect of Porosity in Electrodeposits," a direct method for the measurement of the permeability of electrodeposited coatings has been developed.

Existence of a variable permeability, not recognized until a few years ago, has been revealed. This factor may account for wide variations in salt-spray and weathering tests.

"The Effect of Impurities, and Purification of Electroplating Solutions" were studied in Project No. 5. A paper on the effects of copper as an impurity in nickel plating solutions was published. A paper on zinc as an impurity is being revised, and the study of the effect of iron in nickel plating solutions is nearly complete. The effect of chromium as an impurity



Good service and good manners know no seasons or markets at Levinson Steel. We might temporarily be out of an item but we're never short on courtesy. You'll always find that the people you deal with at Levinson will gladly go out of their way to be helpful. They'll always say thanks for your order, and they'll never charge a premium for anything—NO MATTER WHAT THE MARKET OR THE SUPPLY.

"Shorty"

LSS-15

Levinson
STEEL SALES CO.

STEEL • ALUMINUM • CORRUGATED SHEETS • CORRULUX TRANSLUCENT PANELS
GRATING • WELDING MACHINES & ELECTRODES • STANDARDIZED METAL BUILDINGS

20TH AND WHARTON STS.

S. S., PITTSBURGH, PA.

Technical Briefs

nickel baths is now under investigation.

Project No. 2 is devoted to "The Determination of Impurities in Electroplating Solutions."

Project No. 11, "Current and Metal Distribution in Electroplating" deals with how to space anodes and get uniform distribution over irregularly shaped objects.

Up to now Project No. 10 has concentrated on disposal of cyanide wastes.

Diesels:

Lightweight, experimental engine shows design improvements . . .

The present highly developed diesel engine is still far from its ultimate power and speed limits, according to N. M. Reiners of the Society of Automotive Engineers.

Reiners, manager of the Cummins Research Laboratory, recently told SAE engineers of experiments on a lightweight, high speed 6-cylinder, 401-cu in. diesel which develops 345 hp at 4000 rpm.

He emphasized the engine is purely an experimental model and currently is not intended for production. The experiments, however, he said, had demonstrated that the present highly developed diesel engine is still far from its ultimate limit.

The diesel of the future will probably have high speed, higher piston displacement, smokeless and efficient high speed combustion, and lighter weight due to greater use of aluminum.

Fast Drying Aluminum Paint

Air drying within 30 minutes is reported possible with a new high-heat-resistant aluminum paint. The new paint, made by Speco, marks a radical departure from ordinary "high-heat" paints which usually must be baked on and will not air dry.

The paint, reported capable of withstanding temperatures up to 1700°F, uses a silicone base and is said to fuse with surface metal. It forms a bright, elastic finish resistant to moisture, corrosion, mild acids, alkalis and industrial fumes.

ALUMINUM EXTRUSIONS

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Any shape that can be contained in a 6 inch circle. Any length up to 40 feet. Send drawings, specifications and data.

Fabrication facilities available!

We are equipped for aluminum fabrication from extrusion to finished product.

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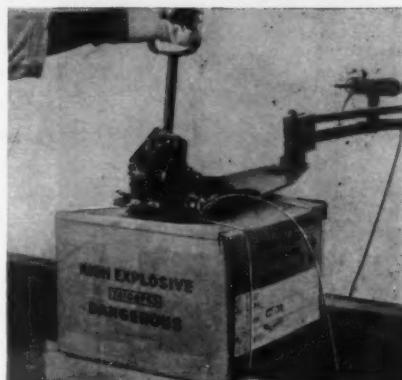
Telephone Fidelity 2-5500

Get the most out of your strapping . . . TIE DEFENSE ORDERS WITH GERRARD ROUND STEEL STRAPPING

GERRARD ROUND STRAPPING complies fully with the joint Army-Navy specifications JAN-P-106A, JAN-P-107, and JAN-P-108 for overseas packing. That means it is strong enough to do a good job.

It has other advantages besides strength, however. Because it is round, it is ideal for palletizing either regular or odd-shaped units, and it can be applied as a Diagonal Tie to give secure reinforcement to all six sides of a box or carton.

Why not consult a Gerrard engineer about your defense strapping problems? He may be able to suggest a method of strapping that will help get more use out of your available strapping. Strapping ordered for defense receives preferences in delivery according to current regulations. Strapping available for non-defense orders is being equitably distributed among our customers.



Two 16 ga. round steel straps close and reinforce this carton of powder. This method of closure permits cartons to be reused many times. Gerrard Model TI machine is mounted on suspension arm.

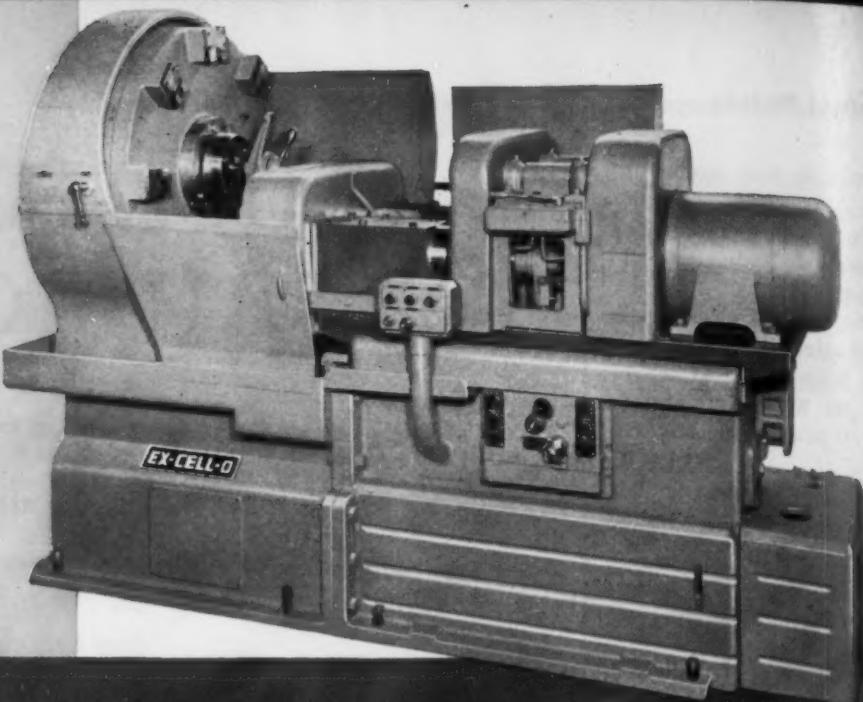
Gerrard Steel Strapping Company
4705 South Richmond St., Chicago 32, Ill.

GERRARD ROUND STEEL STRAPPING

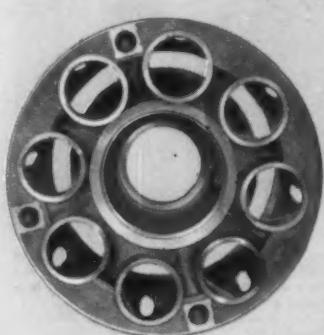
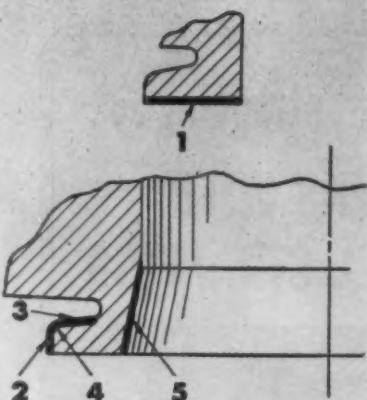
UNITED STATES STEEL



Ex-Cell-O One-Way Precision Boring Machine.



5 OPERATIONS ON 8 HOLES IN LARGE JET PART



Five operations are performed on each of eight large burner holes in this jet engine part.

A TYPICAL EX-CELL-O SOLUTION TO A DIFFICULT PRODUCTION PROBLEM

THE JOB: a large jet engine part requiring complex precision machining.

THE MACHINE: Ex-Cell-O One-Way Precision Boring Machine equipped with two heavy duty spindles and a manually indexed fixture.

THE RESULT: five precision operations on eight large holes (a total of 40 operations). Net production—about three pieces per hour.

Operations performed are shown at left in heavy lines. The front spindle carries a facing head which feeds radially to face the front of the flange (1). The boring head of the rear spindle carries four tools, three of which are on slides. These successively (2) turn the O.D. of the flange, (3) back-face the flange, (5) taper-bore the I.D., and (4) plunge the radius at completion of the back-facing cut. For further information contact your local Ex-Cell-O representative or write direct.

EX-CELL-O CORPORATION

DETROIT 31
MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

It's Washington's Move on Steel's CMP Suggestions

Industry offers trained men for Washington service . . . But wants their experience utilized . . . Lack of steel, equipment and parts delays expansion . . . Cancellations don't appear.

If Washington officials aren't able to unsnarl the controls tangle, they'll have to look somewhere other than the steel industry to find a whipping boy. This became clear last week when steel leaders broke their long silence and fired a list of point-blank suggestions on how to improve production planning. These suggestions cannot be ignored.

They strike at the causes of the distribution snafu. And they offer concrete proposals which, if put into effect, can help correct inequities and make the Controlled Materials Plan work. Above all, these suggestions are the fruit of real industry experience. They must not be ignored if controls are to work more smoothly.

Your Move—The next move is up to top mobilization officials. What are they going to do about it? Since the industry suggestions were requested by Chief Mobilizer Wilson, it is presumed that he will direct certain alterations be made in controls tailoring to fit industry's needs.

Aside from operational faults, the suggestions pointed to a glaring organizational weakness in control structure. The policy committee of Defense Production Administration in charge of determining overall industry requirements does not work closely enough with the screening committee of the Iron & Steel Div. of National Production Authority.

Two-Way Street—Despite the fact that steel leaders don't believe an all-out CMP is needed to supply military requirements esti-

mated at only 15 pct of 1952 steel output, they pledge full support. They promise to make their own trained personnel available for service in Washington. In return they want the experience and training of these men to count. This could help prevent many of the operating mistakes in CMP.

Cancellations—Consumer appeals to NPA for relief from fourth quarter allotment cutbacks are reported to have all been processed about a week ago. But as yet there is no sign of any sizable tonnages being cancelled.

The carryover control order, also aimed at opening mill space, is achieving no better results. Steel producers are beginning to doubt that either of these moves will cause substantial cancellations for some time. Consumers whose third quarter tonnage was shipped after Oct. 7 are expected to hold off cancellation of any of their fourth quarter tonnage as long as they can legally do so.

NPA product men are continually checking the mills to find out if open space has shown up on any products. They've found little. When they do find open space they ask mills to fill it with specific orders they request be taken.

Order Books—There are several reasons why mills aren't booking orders (except military) very far ahead. They feel most of these would be dummy orders—that the consumer doesn't really know sizes and specifications he will need. Also, later government regulations might make the orders invalid. The cost of altering orders

is running administrative expenses sky high.

Expansion—Steel people are gravely concerned with the problem of procuring materials needed to complete steel expansion projects and keep present facilities adequately maintained. Cuts in structurals, extended delivery of mill equipment and shortages of certain parts are pushing completion dates further into the future. One executive is now trying to get enough steel to put a roof over equipment already built.

Other producers reported extended delivery of equipment is being caused by shortages of such items as electric motors and castings. Overhead cranes are a problem. Any kind of wire rope or cable is practically unobtainable, without long delivery dates. Electric motors are running 6 months behind. Companies making fuses are 7 months behind.

Meshing Parts—Under these conditions it is extremely difficult to keep all phases of an expansion program progressing at the same rate. One mill executive reported that mechanical departments are running ahead of electrical departments—just the reverse of normal conditions.

Raw materials, of course, are a worry, too. Scrap is at the head of the list. Some are also concerned about ore boats to feed the enlarged capacity. They point out that several of the boats now planned won't be ready for 18 months.

Ingot Rate Up—Steelmaking operations this week are scheduled at 102 pct of rated capacity, up half a point from the previous week.



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The Iron Age

THE ONLY ABC METALWORKING WEEKLY

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Market Briefs

Pig juggling—Some pig iron suppliers have been doing a job of filling in their customers' needs when other sources fail. If, for example, a foundry's imports are delayed, the foundry calls his domestic supplier who gives him advance allotments to keep the plant going. When foreign iron does arrive, foundry notifies supplier who stops shipments for a while. The supplier has gone out on a limb, stretching his own stocks, but the fires didn't go out and he has made a lasting friend.

Tinplate—Can companies were given fairly liberal allotments of tinplate, but were restricted as to types of cans it can be used to make. Some of their customers are also restricted on the number of tin cans they can use to package certain items. Result: There appears to be an oversupply of tinplate to some can manufacturers. Of course the apparent imbalance is caused by controls.

Nice figures—Hourly payments to iron and steel industry wage earners averaged \$1.391 in August, an increase of 21.4¢ an hr over the August average last year, according to American Iron & Steel Institute figures. Average work week was 40.4 hr, as opposed to 39.7 hr in Aug., 1950. Estimated total payroll was \$246,670,000 a rise of more than 19 pct over the same period last year. Employment continued to rise this August to a new record of 679,100.

Yankee business good—Defense work is keeping overall business activity in New England high, despite weakness in several important fields, according to Federal Reserve Bank of Boston. Durable goods were thriving in September with machine tools, metal fabricating and shipyard construction among the leaders.

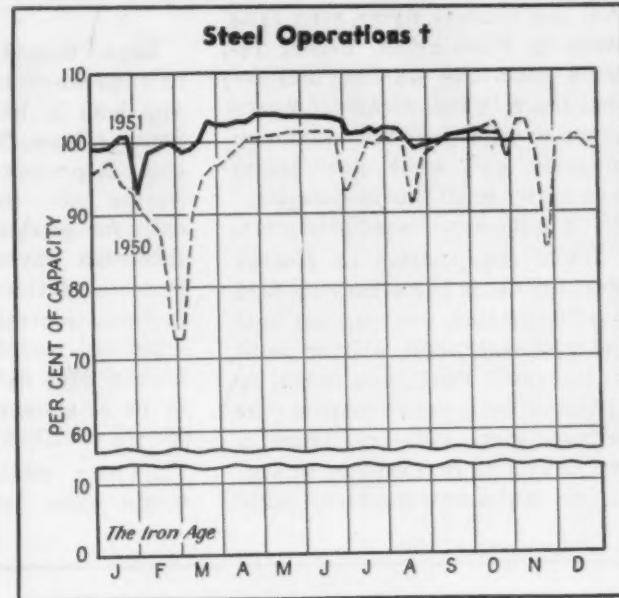
Drop tungsten duty—In Washington, the House voted to cancel the \$8-per-ton duty on tungsten. Duty is suspended, under the bill, for 2 years unless the average price in any month drops below \$63 per ton. Prompt Senate approval of the bill is expected.

More steel lost—A wildcat strike of 400 Local 1010 CIO-United Steel Workers early this week idled 18,000 workers at the Inland Steel Co.'s plant in East Chicago, Ind. Company officials and supervisory employees were mobilized to bank furnaces and coke ovens. The strike grew out of a walkout of 96 pickling department employees earlier over a dispute on incentive rates. The company will lose 10,764 tons of steel ingots daily.

Structurals—The well publicized overdemand for structurals is being taken with a grain of salt by some producers (fourth quarter requirements were stated at 223 pct of estimated supply). In one case two states sent in requests for structurals for the same highway job. In other cases consumers have attempted to place orders 6 to 10 months ahead of need. Tightness in plates is reported to be more realistic.

Shipping records—Cargoes of Great Lakes ore carrying fleet for September totaled 12,671,805 gross tons, a figure exceeded only in 1942. Combined shipments of ore, coal and grain at 120,828,758 net tons set a new peacetime mark for this part of the season, topped only by 1944's total of 125,771,311 tons.

Resuming production—Ending a 2-week shutdown, the Brier Hill openhearth plant of Youngstown Sheet & Tube Co. resumed operations early this week. Meanwhile union and company meetings are being held on incentive disputes causing the strikes and slowdowns that resulted in closing of the openhearth shop. Steel finishing facilities were being restored as steel became available. The shutdown strike cost approximately 45,000 ingot tons of steel.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Oct. 7	101.0*	96.5*	95.0	101.0	103.0	104.0	100.0*	103.0	104.0	104.0	93.0	95.0	126.0	101.5
Oct. 14	101.0	107.5	95.0	101.0	104.0	104.0	98.5	103.0	104.0	104.0	97.0	98.0	90.0	102.0

* Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.
† Revised.

Nonferrous Markets

Reynolds to Build More Capacity

GSA sends letter of intent for 60,000 tons of capacity . . . More alumina facilities set for Corpus Christi . . . Suggest subsidizing new lead, zinc, copper mines—By R. L. Hatschek.

A letter of intent has been issued by General Services Administration to Reynolds Metals Co. for construction of an additional 60,000 tons a year of aluminum capacity. At least 55,000 tons of this will be added at Jones Mills, Ark., and a provision has been made for another 1000-ton-a-day addition to alumina facilities. The latter will be built at Reynolds' new Corpus Christi, Tex., plant and will use Jamaican bauxite. Private financing is to be backed up by a government procurement contract and government guarantee of the loans where and if required.

Montana Aluminum—It seems that old charges never even fade away in Washington. Recent reports from the Capitol indicate that there is still plenty of worry about monopoly in the aluminum industry and some government men object to all this new capacity going to the established producers.

While the position of Harvey Machine Co. in the aluminum field is still clouded, you can bet that the proposed plant will be built in Kalispell, Mont., and it will be operated by a newcomer to the primary ingot industry. There is strong feeling in some government circles that a new producer ought

to be subsidized to get him over the financial hurdles encountered in getting started.

Revise Estimate—Aluminum Co. of America figures that drought-caused predictions on aluminum losses were 73 pct too pessimistic and now estimates a loss of 1100 tons of its production. The company's estimate of its 1951 production was revised to 426,700 tons, well above the previous record. The short-range picture for aluminum supplies is still pretty bleak, however, with the military estimated to take better than 40 pct of first half 1952 aluminum output as well as 40 pct of the brass mill products in that period.

Mine Subsidies—Subsidizing new production of copper, zinc and lead is being talked up by Senator James Murray (D., Mont.) and Representative Walter S. Baring (D., Nev.), whose plan calls for establishment of a Mine Incentive Payments Div. within Defense Materials Procurement Agency. General Services Administration would do the buying from a \$100 million annual fund to be established and earmarked for the premium payments.

Other metals and minerals would come under the plan if

they were certified to be in short supply and essential to defense mobilization. A provision is also included for diversion of materials mined under the program to private industry as well as to government stockpiles.

Metal Recovery—National Lead Co. is to undertake a \$5 million expansion of facilities for the recovery of cobalt, nickel and copper from rejected iron concentrates at Fredericktown, Mo. A government loan will finance all new equipment and the government will take the total output at guaranteed prices of \$1.845 per lb of cobalt, 47.4¢ per lb of nickel and 21.4¢ per lb of copper, f.o.b. Completion date is within 18 months and estimated annual production is 1,386,000 lb of cobalt, 1,852,200 lb of nickel and 1,417,000 lb of copper.

Scrap Drive Rolling—Last week the wheels were set in motion for a nonferrous metals scrap drive. A temporary scrap mobilization committee was set up, much as was done in the field of ferrous scrap. It was suggested that (1) electrolytic copper scrap prices be fixed, (2) copper and copper base scrap be removed from the strategic materials list and be made available to industry and (3) a ceiling be placed on dealer activities.

All manner of scrap metal is vitally needed by industry and this latest development can be a very good thing if it is properly handled. One further step has been called for by industry many times in the recent past and that is government allocation of scrap metals.

New Prices Soon?—Office of Price Stabilization is working out a new schedule of prices for lead and zinc scrap which will put them back into the relationship with primary metal that they held prior to Oct. 2 when the ceilings on those metals were boosted 24

NONFERROUS METAL PRICES

	Oct. 10	Oct. 11	Oct. 12	Oct. 13	Oct. 15	Oct. 16
Copper, electro, Conn. . .	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered . . .	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York . . .	\$1.03	\$1.03	\$1.03	....	\$1.03	\$1.03*
Zinc, East St. Louis . . .	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis . . .	18.80	18.80	18.80	18.80	18.80	18.80

*Tentative

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

Base 30,000 lb, f.o.b. ship. pt. frt. allowed	
Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 15.0¢; 22¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 52S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 52S, 75S-OAL, 39.5¢; 0.081 in., 2S, 3S, 31.1¢; 75S-OAL, 41.8¢; 0.082 in., 2S, 3S, 31.1¢; 75S-OAL, 41.8¢; 52S, 39.8¢; 24S-O, 32¢; 45, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 45.1¢; 41.7¢; 75S-O, 75S-OAL, 52.2¢.	
Plate 1/4 in. and heavier: 2S, 3S-F, 28.8¢; 52S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 32.4¢; 75S-OAL, 38.8¢.	
Extruded Solid Shapes: Shape factors 1 to 6, 24¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 36, 39.6¢ to 81.1¢; 36 to 38, 47.2¢ to \$1.70.	
Red, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 8 in., 2S-F, 3F, 40.8¢ to 86¢.	
Screw Machine Stock: Rounds, 11S-T3, 3¢ to 11/32 in., 53.5¢ to 42¢; 3¢ to 1 1/2 in., 41.8¢ to 39¢; 1 9/16 in. to 3 in., 38.5¢ to 36¢; 17S-T4 over by 1.5¢ per lb. Base 5000 lb.	
Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 52¢ to 29¢; 52S, 46¢ to 35¢; 61S, 51¢ to 26¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48¢ to 36¢; 75S-T6, 84¢ to 75¢.	
Extruded Tubing: Rounds: 63-S-T-5, OD in. 1-1/2 to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.	
Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., \$1.42; 96 in., \$1.522; 120 in., \$1.902; 144 in., \$2.284. Gauge 0.24 x 28 in., \$1.870; 96 in., \$1.839; 120 in., \$2.299; 144 in., \$2.759. Coiled Sheet: 0.019 in. x 28 in., \$2.24 per lb; 0.024 in. x 28 in., 26.9¢ lb.	

Magnesium

(P.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 63¢; 3/16 in., 46¢; 1/8 in., 67¢; B & S Gage 10, 68¢; 12, 72¢; 16, 75¢; 18, 84¢; 20, \$1.06; 22, \$1.27; 24, \$1.67. Specification grade higher. Base: 30,000 lb.	
Extruded Round Rod: M, diam in., 1/4 to 4.11 in., 74¢; 1/2 to 5/8 in., 57.5¢ to 1.74¢; 5/8, 21/2 to 5 in., 48.5¢. Other alloys higher. Base Up to 3/4 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.	
Extruded Solid Shapes, Rectangles: M, in. weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.8¢; 0.22 to 0.25 lb, 5.9 in., 59.8¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.58 lb, 19.5 in., 53.8¢; 4 to 18 lb, 28 in., 49¢. Other alloys higher. Base, in. weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/2 to 180 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.	
Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 in. to 4/16 in., \$1.40; 5/16 to 1/2 in., \$1.26; 3/4 to 5/8 in., 1.65 to 0.219, 1/2 to 3/4 in., 1.6¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1/2 in., 10,000 lb; 1 1/2 in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.	

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$8; Forgings, \$6.	
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Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60 1/2
strip, cold-rolled	83	63 1/2
rods and bars	78	58 1/2
angles, hot-rolled	73	58 1/2
plates	75	59 1/2
seamless tubes	106	93 1/2
shot and blocks		53 1/2

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Shapes	Extruded
Copper	41.68	37.53	41.28	
Copper, h-r		38.78		
Copper, drawn	39.67	39.36		
Yellow brass	38.28	37.97		
Cold brass	40.14	39.82		
Lead brass	43.20	37.26	38.52	
Lead-copper	41.58			
Toml' bronze	41.13	40.82		
Mang. bronze	46.92	40.81	42.37	
Mon. bronze	61.07	61.32		
Alum. bronze	41.18	36.74	37.99	
silver, 10 pct	49.82	52.04		

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	\$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	\$69.00
Bismuth, ton lots	\$2.35
Cadmium, del'd	\$2.55
Cobalt, 97-99% (per lb)	\$2.40 to \$2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Iridium, dollars per troy oz.	\$2.25
Lead, St. Louis	18.80
Lead, New York	19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$220-\$222
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$90 to \$93
Silver, New York, cents per oz.	88.00
Tin, New York	\$1.03
Titanium, sponge	\$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.29
Zirconium copper, 50 pct.	\$6.20

REMETAL METALS

Brass Ingot

(Cents per lb, delivered carloads)

35-5-5-5 Ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 Ingot	
No. 305	32.25
No. 315	30.25
88-10-2 Ingot	
No. 210	40.00
No. 215	38.50
No. 245	33.50
Yellow Ingot	
No. 405	23.25
Manganese bronze	
No. 421	29.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97%	18.00
Grade 2—92-95%	17.75
Grade 3—90-92%	17.25
Grade 4—85-90%	16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33%
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34%
Zinc, oval	26 1/2
Ball anodes	25 1/2
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	\$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, f.r.t. allowed	20 1/2
Nickel chloride, 375 lb drum	27 1/2
Silver cyanide, 100 oz lots, per oz	67 1/2
Sodium cyanide, 96 pct domestic	15
200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1/4¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

Copper	Heavy	Turnings
Yellow Brass	21 1/2	20%
Red brass	20 1/2	19%
Comm. bronze	20 1/2	19%
Mang. bronze	18 1/2	17%
Brass rod ends	18 1/2	17%

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.25
No. 1 comp. turnings	18.25
Radiators	14.75

Dry Copper Content

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.25
No. 1 comp. turnings	18.25
Radiators	14.75

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

No. 1 heavy copper and wire	18 1/2—19 1/2
No. 2 heavy copper and wire	17 1/2—17 1/2
Light copper	16—16 1/2
New type shell cuttings	16—16 1/2
Auto radiators (unsweated)	14 1/2—14 1/2
No. 1 composition	18—18 1/2
No. 1 composition turnings	17 1/2—18 1/2
Unlined red car boxes	16 1/2—17 1/2
Cocks and faucets	15 1/2—16
Mixed heavy yellow brass	12—12 1/2
Old rolled brass	15—15 1/2
Brass pipe	16—16 1/2
New soft brass clippings	16—16 1/2
Brass rod ends	15 1/2—16
No. 1 brass rod turnings	15—15 1/2

Aluminum

Alum. pistons and struts	6 1/2—7 1/2
Aluminum crankcases	7 1/2—8
2S aluminum clippings	10 1/2
Old sheet and utensils	7 1/2—8
Borings and turnings	5—6
Misc. cast aluminum	7 1/2—8
Dural clips (24S)	10—11

Iron and Steel Scrap Markets

"Pancake" Junk Car Idea Catches On

Bethlehem Steel's method modified for successful use in Cleveland . . . Schlesinger & Sons removes motors, axles, etc. . . . Scrap pricing order scheduled for this week.

Supplementing shortage-inspired initiative of auto graveyard dealers in boosting movement of junk cars into scrap channels, the Bethlehem Steel Co. method of flattening hulks under a 2-ton plate is getting both fanfare and use in Columbus, Ohio.

The pancake process has been modified by I. H. Schlesinger & Sons and found successful. Mr. E. Schlesinger said that following a

OPS' scrap pricing amendment reportedly joining No. 1 and No. 2 heavy melting steel at a compromise price was to be issued late this week. It was originally "definitely" scheduled for Tuesday but was pulled back from top OPS level for some undisclosed changes.

story in this magazine (THE IRON AGE, Aug. 30, p. 89) and subsequent NPA promotion, he decided that the method might be feasible. As a result, one man and one truck are now doing the work of six men and four trucks. From 25 to 30 car "pancakes" are shipped on the same truck that could haul only five wrecks previously.

Originally Bethlehem compressed the car body as it stood, without removing motor block, transmission, or other heavy parts. Schlesinger gets a true "pancake" by slamming only the body with the heavy parts removed.

To date the firm has pancaked about 1000 wrecks at the graveyard

of G. W. Worthman & Co. The crane and electro-magnet holding the 2-ton plate were moved to the yard on a low-boy trailer. Before, a crew could move only 5 tons of auto scrap a day. With the pancake method, two men and a magnet can produce almost 20 tons per day.

Pittsburgh—Despite the continuing struggle for scrap, mills in the Pittsburgh area are doing a good job of maintaining capacity operations. Operating rate this week is 100 pct of capacity. Scrap continues to be the key to how long this rate will hold up.

Chicago—Movement to mills here may have registered a slight increase. Much scrap is still being shipped out to out-of-district mills. Cast market shows signs of a pickup as consumers start to build up stocks for winter. Lack of good heavy scrap still hampers maximum production.

Philadelphia — Local mills were hanging by a thread early this week and some were accepting shipments over the weekend, and unusual practice. Overgrading is becoming more general. Scrap still moves westward. Production may be lost if situation does not improve soon.

New York — OPS was ready this week to amend its scrap pricing order. Hot rumors had it that price for No. 1 and No. 2 would be \$1 under present



BEFORE, AFTER: In left hand picture, 2-ton plate is held poised by crane's magnet. After three or four poundings the car hulk becomes a "pancake".

No. 1 price and foundry grade premiums would be cut. Scrap flow here has improved over August.

Detroit—Buyers say the situation here continues touch-and-go. It is now a race between dwindling plant scrap generation and the weather. With further cutbacks in auto output coming up, a crisis is expected to develop very early in the winter.

Cleveland—Openhearth scrap stocks seem healthier but blast furnace piles are flat. Most mills are a notch above car-to-furnace operations. The situation is not sound by any means. One mill is hurting. Cast grades may firm up soon. Strike slowdown at another mill has let it build up inventory.

St. Louis—Rumor that OPS would group openhearth grades has slowed down the movement of scrap iron, as holders hope to realize higher price for those grades below No. 1 heavy melting steel. Scrap stocks shrink.

Birmingham — Situation in this area is little changed. Electric furnaces are in bad shape and are going far afield in search of scrap. Broken and dealers report they are getting a little free heavy melting and cast scrap but not enough.

Cincinnati—Openhearth grades are easier now than last month but anxiety mounts over winter operations. The cast market is loaded with uncleared motor blocks—reportedly because of an inadequate preparation allowance. Some mills have tried them and reported bad results. Some car loads of allocated scrap from outside the area have been rejected.

Boston — There was a return to good activity last week. All items were moving with the exception of motors. This cast material was the only sluggish mover on the list.

Buffalo — Receipts continue slow, with production scrap off as much as 30 pct. Drop seen result of production cutbacks and change-overs. Dealers expect mills will be forced to curtail operations early next year.

Scrap Prices

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →		Basing Points →																		Delivered Prices (Dollars per gross ton) ←																																																																																					
GRADES	OPS No.	Pittsburgh	Johnstown	Braddock	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Coatesville	Cochran	Harrisburg	Phenixville	Sparrow Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	St. Louis	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles	Pittsburgh	San Francisco	Seattle																																																																	
No. 1 heavy melting	1	\$44.00	\$44.00	\$43.00	\$42.50	\$42.00	\$41.00	\$41.15	\$40.00	\$39.50	\$39.00	\$38.00	\$37.00	\$36.00	\$35.00	\$35.00	\$34.00	\$33.00	\$32.00	\$31.00	\$30.00	\$29.00	\$28.00	\$27.00	\$26.00	\$25.00	\$24.00	\$23.00	\$22.00	\$21.00	\$20.00	\$19.00	\$18.00	\$17.00	\$16.00	\$15.00	\$14.00	\$13.00	\$12.00	\$11.00	\$10.00	\$9.00	\$8.00	\$7.00	\$6.00	\$5.00	\$4.00	\$3.00	\$2.00	\$1.00	\$0.00																																																						
No. 2 heavy melting	2	42.00	42.00	41.00	40.50	40.00	39.00	39.15	38.00	37.50	37.00	36.00	35.00	34.00	33.50	33.00	32.00	31.50	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																							
No. 1 busheling	3	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	36.00	35.50	35.00	34.00	33.50	32.00	31.50	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																					
No. 2 bundles	4	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	36.00	35.50	35.00	34.00	33.50	32.00	31.50	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																					
Machining shop turnings	5	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	33.00	32.50	32.00	31.50	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																								
Mixed borings and turnings	6	34.00	34.00	33.00	32.50	32.00	31.00	31.15	30.00	29.50	29.00	28.00	27.00	26.00	25.50	25.00	24.50	24.00	23.50	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																														
Shovelling turnings	7	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.50	29.00	28.50	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																											
Cast iron borings	10	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.50	29.00	28.50	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																											
No. 1 chemical borings	26	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	33.00	32.50	32.00	31.50	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	17.00	16.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	0.00																																																								
Forge crops	11	51.50	51.50	50.50	50.00	49.50	49.00	48.50	48.00	47.50	47.00	46.50	46.00	45.50	45.00	44.50	44.00	43.50	43.00	42.50	42.00	41.50	41.00	40.50	40.00	39.50	39.00	38.50	38.00	37.50	37.00	36.50	36.00	35.50	35.00	34.50	34.00	33.50	33.00	32.50	32.00	31.50	31.00	30.50	30.00	29.50	29.00	28.50	28.00	27.50	27.00	26.50	26.00	25.50	25.00	24.50	24.00	23.50	23.00	22.50	22.00	21.50	21.00	20.50	20.00	19.50	19.00	18.50	18.00	17.50	17.00	16.50	16.00	15.50	15.00	14.50	14.00	13.50	13.00	12.50	12.00	11.50	11.00	10.50	10.00	9.50	9.00	8.50	8.00	7.50	7.00	6.50	6.00	5.50	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50	0.00
Bar crops and plate	12	49.00	49.00	48.00	47.50	47.00	46.50	46.00	45.50	45.00	44.50	44.00	43.50	43.00	42.50	42.00	41.50	41.00	40.50	40.00	39.50	39.00	38.50	38.00	37.50	37.00	36.50	36.00	35.50	35.00	34.50	34.00	33.50	33.00	32.50	32.00	31.50	31.00	30.50	30.00	29.50	29.00	28.50	28.00	27.50	27.00	26.50	26.00	25.50	25.00	24.50	24.00	23.50	23.00	22.50	22.00	21.50	21.00	20.50	20.00	19.50	19.00	18.50	18.00	17.50	17.00	16.50	16.00	15.50	15.00	14.50	14.00	13.50	13.00	12.50	12.00	11.50	11.00	10.50	10.00	9.50	9.00	8.50	8.00	7.50	7.00	6.50	6.00	5.50	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50	0.00					
Punchings and plate	14	46.50	46.50	45.50	45.00	44.50	44.00	43.50	43.00	42.50	42.00	41.50	41.00	40.50	40.00	39.50	39.00	38.50	38.00	37.50	37.00	36.50	36.00	35.50	35.00	34.50	34.00	33.50	33.00	32.50	32.00	31.50	31.00	30.50	30.00	29.50	29.00	28.50	28.00	27.50	27.00	26.50	26.00	25.50	25.00	24.50	24.00	23.50	23.00	22.50	22.00	21.50	21.00	20.50	20.00	19.50	19.00	18.50	18.00	17.50	17.00	16.50	16.00	15.50	15.00	14.50	14.00	13.50	13.00	12.50	12.00	11.50	11.00	10.50	10.00	9.50	9.00	8.50	8.00	7.50	7.00	6.50	6.00	5.50	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50	0.00										
Electric furnace bundles	15	46.00	46.00	45.00	44.50	44.00	43.50	43.00	42.50	42.00	41.50	41.00	40.50	40.00	39.50	39.00	38.50	38.00	37.50	37.00	36.50	36.00	35.50	35.00	34.50	34.00	33.50	33.00	32.50	32.00	31.50	31.00	30.50	30.00	29.50	29.00	28.50	28.00	27.50	27.00	26.50	26.00	25.50	25.00	24.50	24.00	23.50	23.00	22.50	22.00	21.50	21.00	20.50	20.00	19.50	19.00	18.50	18.00	17.50	17.00	16.50	16.00	15.50	15.00	14.50	14.00	13.50	13.00	12.50	12.00	11.50	11.00	10.50	10.00	9.50	9.00	8.50	8.00	7.50	7.00	6.50	6.00	5.50	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50	0.00											
Cut struct., plate, 3 ft and less	16	47.00	47.00	46.00	45.50	45.00	44.50	44.00	43.50	43.00	42.50	42.00	41.50	41.00	40.50	40.00	39.50	39.00	38.50	38.00	37.50	37.00	36.50	36.00	35.50	35.00	34.50	34.00	33.50	33.00	32.50	32.00	31.50	31.00	30.50	30.00	29.50	29.00	28.50	28.00	27.50	27.00	26.50	26.00	25.50	25.00	24.50	24.00	23.50	23.00	22.50	22.00	21.50	21.00	20.50	20.00	19.50	19.00	18.50	18.00	17.50	17.00	16.50	16.00	15.50	15.00	14.50	14.00	13.50	13.00	12.50	12.00	11.50	11.00	10.50	10.00	9.50	9.00	8.50	8.00	7.50	7.00	6.50	6.00	5.50	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50	0.00									
Cut struct., plate, 2 ft and less	17	49.00	49.00	48.00	47.50	47.00	46.50	46.00	45.50	45.00	44.50	44.00	43.50	43.00	42.50	42.00	41.50	41.00	40.50	40.00	39.50	39.00	38.50	38.00	37.50	37.00	36.50	36.00	35.50	35.00	34.50	34.00	33.50	33.00	32.50	32.00	31.50	31.00	30.50	30.00	2																																																																

Comparison of Prices

Steel prices on this page are the average of various quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

	Oct. 16	Oct. 9	Sept. 18	Oct. 17
Flat-Rolled Steel: (cents per pound)	1951	1951	1951	1950
Hot-rolled sheets	3.80	3.80	3.80	3.85
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	34.50

Tin and Ternplate: (dollars per base box)	\$8.70	\$8.70	\$8.70	\$7.50
Tinplate (1.50 lb.) cokes	7.40	7.40	7.40	6.60
Tinplate, electro (0.50 lb.)	7.50	7.50	7.50	6.35

Bars and Shapes: (cents per pound)	3.70	3.70	3.70	3.45
Merchant bars	4.55	4.55	4.55	4.145
Cold finished bars	4.30	4.30	4.30	3.95
Alloy bars	3.65	3.65	3.65	3.40
Structural shapes	31.50	31.50	31.50	30.00
Stainless bars (No. 302)	9.50	9.50	9.50	9.50

Wire: (cents per pound)	4.85	4.85	4.85	4.50
Bright wire				

Rails: (dollars per 100 lb)	\$3.60	\$3.60	\$3.60	3.40
Heavy rails	4.00	4.00	4.00	3.75

Semifinished Steel: (dollars per net ton)	\$56.00	\$56.00	\$56.00	\$54.00
Rerolling billets	56.00	56.00	56.00	54.00
Slabs, rerolling	66.00	66.00	66.00	63.00
Forging billets	70.00	70.00	70.00	66.00

Wire Rod and Skelp: (cents per pound)	4.10	4.10	4.10	3.85
Wire rods	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Oct. 16, 1951	Oct. 9, 1951	Sept. 18, 1951	Oct. 17, 1950
No. 2 foundry, del'd Phila.	\$57.77	\$57.77	\$57.77	\$52.77
No. 2, Valley furnace	52.50	52.50	52.50	49.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	52.58
No. 2, Birmingham	48.88	48.88	48.88	45.88
No. 2, foundry, Chicago	52.50	52.50	52.50	49.50
Basic del'd Philadelphia	56.92	56.92	56.92	51.92
Basic, Valley furnace	52.00	52.00	52.00	49.00
Malleable, Chicago	52.50	52.50	52.50	49.50
Malleable, Valley	52.50	52.50	52.50	49.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese	186.25	186.25	186.25	173.40

*The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

†Average of U. S. prices quoted on Ferroalloy page.

Scrap:

Scrap: (per gross ton)	No. 1 steel, Pittsburgh	No. 1 steel, Phila. area	No. 1 steel, Chicago	No. 1 bundles, Detroit	Low phos. Young'n	No. 1 east, Pittsburgh	No. 1 east, Philadelphia	No. 1 east, Chicago
No. 1 steel, Pittsburgh	\$44.00*	\$44.00*	\$44.00*	\$43.75				
No. 1 steel, Phila. area	42.50*	42.50*	42.50*	38.50				
No. 1 steel, Chicago	42.50*	42.50*	42.50*	39.75				
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	37.25				
Low phos. Young'n	46.50*	46.50*	46.50*	46.25				
No. 1 east, Pittsburgh	49.00†	49.00†	49.00†	54.75				
No. 1 east, Philadelphia	49.00†	49.00†	49.00†	51.50				
No. 1 east, Chicago	49.00†	49.00†	49.00†	54.50				

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville:

Coke: Connellsville: (per net ton at oven)	Furnace coke, prompt	Foundry coke, prompt	\$14.75	\$14.75	\$14.75	\$14.25
			17.75	17.75	17.75	16.75

Nonferrous Metals:

Nonferrous Metals: (cents per pound to large buyers)	Copper, electro, Conn.	Copper, Lake, Conn.	Tin, Straits, New York	Zinc, East St. Louis	Lead, St. Louis	Aluminum, virgin	Nickel, electrolytic	Magnesium, ingot	Antimony, Laredo, Tex.
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.03†	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80
Aluminum, virgin	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58	59.58	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00

†Tentative.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1944 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

Pig Iron

Pig Iron	\$52.69 per gross ton	\$43.00 per gross ton
	52.69 per gross ton	43.00 per gross ton
	52.69 per gross ton	43.00 per gross ton

Scrap Steel

Scrap Steel	\$43.00 per gross ton	\$43.00 per gross ton
	43.00 per gross ton	43.00 per gross ton
	43.00 per gross ton	43.00 per gross ton

High

High	Low	High	Low
\$52.69 Jan. 2	\$52.69 Jan. 2	\$47.75 Jan. 30	\$43.00 Feb. 7
52.69 Dec. 12	45.88 Jan. 3	45.13 Dec. 19	26.25 Jan. 3
46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24
	23.61	\$19.17	\$19.17
	23.61	19.17	19.17

Low

High	Low	High	Low
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
23.25 June 21	19.81 July 6	15.00 Nov. 22	11.00 June 7
32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

THE IRON AGE, October 18, 1951.

		Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page. Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.													
		Pittsburgh	Chicago	Gary	Cleveland	Canton-Massillon	Middle-town	Youngstown	Bethle-hem	Buffalo	Consho-hocken	Johns-town	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	\$52.00 ¹														
Alley, net ton	\$54.00 ^{1,17}													\$54.00 ¹¹	
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	\$56.00 ^{1,5}	\$56.00 ¹	\$56.00 ¹							\$56.00 ³		\$56.00 ³			
Carbon forging billets, net ton	\$68.00 ^{1,5}	\$68.00 ^{1,4}	\$68.00 ¹	\$68.00 ⁴	\$68.00 ⁴					\$68.00 ³ 4	\$73.00 ¹⁶	\$68.00 ³		\$80.00 ¹¹	
Alloy, net ton	\$70.00 ^{1,17,6}	\$70.00 ^{1,4}	\$70.00 ^{1,6}		\$70.00 ⁴				\$70.00 ³ 4	\$70.00 ³	\$77.00 ¹⁶	\$70.00 ³		\$73.00 ¹¹	
PIPE SKELP	3.35 ¹ 3.45 ⁶						3.35 ^{1,4}								
WIRE RODS	4.10 ² 4.30 ¹⁸	4.10 ^{2,4,33}	4.10 ⁶	4.10 ²			4.10 ⁶		4.10 ⁶		4.10 ⁶	4.20 ⁹			
SHEETS Hot-rolled (18 ga. & hvr.)	3.60 ^{1,5,9,15} 3.75 ¹⁸	3.60 ^{2,23}	3.60 ^{1,6,9}	3.60 ^{4,5}		3.60 ⁷	3.60 ^{1,4,6} 4.00 ¹³		3.60 ³	4.00 ¹⁶		3.60 ³	4.30 ¹³ 4.40 ¹⁷		
Cold-rolled	4.35 ^{1,6,9} 15.7		4.25 ^{1,6,8}	4.35 ^{4,5}		4.35 ⁷	4.35 ^{1,6}		4.35 ³			4.35 ³	5.05 ¹³ 4.85 ¹¹		
Galvanized (10 gage)	4.60 ^{1,9,15}		4.60 ^{1,8}		4.60 ⁴	4.60 ⁷	5.50 ^{4,4} 6.00 ⁴					4.60 ³	5.50 ¹²		
Enameling (12 gage)	4.65 ¹		4.65 ^{1,8}	4.65 ¹		4.65 ⁷	4.65 ⁴						5.25 ¹¹		
Long tonne (10 gage)	5.20 ^{9,15}		5.20 ¹			5.20 ⁷	6.00 ^{6,4}								
Hi str. low alloy, h.r.	5.40 ^{1,5} 5.75 ⁹	5.40 ¹	5.40 ^{1,8} 5.90 ⁶	5.40 ^{1,5}			5.40 ^{1,4,13} 5.90 ⁶		5.40 ³	5.85 ²⁴		5.40 ³	5.80 ¹¹		
Hi str. low alloy, c.r.	6.55 ^{1,5} 6.90 ⁹		6.55 ^{1,8} 7.05 ⁶	6.55 ^{4,5}			6.55 ⁴ 7.05 ⁶		6.55 ³			6.55 ³	7.10 ¹¹		
Hi str. low alloy, galv.	7.20 ¹											6.75 ³			
STRIP Hot-rolled.	3.60 ^{4,4.00⁴¹, 58, 3.75²³ 3.60^{6,7}}	3.50 ⁶	3.50 ^{1,6,8}			3.50 ⁷	3.50 ^{1,4,6} 4.00 ¹³		3.60 ^{3,4}	3.90 ²⁴	3.50 ³	3.50 ³	4.40 ¹⁷ 3.80 ¹¹		
Cold-rolled	4.65 ^{5,7,9} 5.00 ¹⁸ 5.35 ^{4,63,58}	4.90 ^{6,6}	4.90 ⁸	4.65 ^{2,5}		4.65 ⁷	4.65 ^{4,6} 5.25 ^{4,4,49} 5.35 ^{13,40}		4.65 ³			4.65 ³	4.80 ¹³ 5.45 ¹⁷ 5.80 ^{14,41}		
Hi str. low alloy, h.r.	5.75 ⁹		5.80 ¹ 5.30 ^{4,5,800}				4.95 ^{4,5} 5.40 ^{13,5,800}		4.95 ³	5.55 ²⁶		4.95 ²	5.50 ¹¹		
Hi str. low alloy, c.r.	7.20 ⁹			(6.55 ² 6.70 ⁶)					6.40 ³			6.40 ³			
TINPLATE [†] Coke, 1.25-lb base box (1.50 lb, add 25¢)	\$8.45 ^{1,8,9,15}		38.45 ^{1,6,8}				38.45 ⁴					38.45 ³			
Electrolytic 0.25, 0.50, 0.75 lb box							0.25 lb base box, \$7.15 ^{1,4,5,8,9} ; \$7.25 ^{1,11} ; \$7.35 ²²								
0.50 lb, add 25¢; 0.75 lb add 55¢															
BLACKPLATE, 29 gage Hollowware enameling	5.85 ¹ 6.15 ¹⁸		5.85 ¹				5.30 ⁴								
BARS Carbon steel	3.70 ^{1,5} 3.85 ⁹	3.70 ^{1,4,23}	3.70 ^{1,4,6,8}	3.70 ⁴	3.70 ⁴		3.70 ^{1,4,6}		3.70 ^{3,4}		3.70 ³			3.85 ¹ 4.00 ¹⁶	
Reinforcing	3.70 ^{1,5}	3.70 ⁴	3.70 ^{1,6,8}	3.70 ⁴			3.70 ^{1,4,6}		3.70 ^{3,4}		3.70 ³	3.70 ⁸			
Cold-finished	4.55 ^{2,4,5} 52.69.71	4.55 ^{2,23,70}	4.55 ^{4,74, 73}	4.55 ³	4.55 ^{4,82}		4.55 ^{6,57}		4.60 ^{7,6}					4.70 ⁴	
Alloy, hot-rolled	4.30 ^{1,17}	4.30 ^{1,4,23}	4.30 ^{1,6,8}		4.30 ⁴		4.30 ^{1,6}	4.30 ³	4.30 ^{6,4}		4.30 ³			4.40 ¹¹ 4.80 ¹³	
Alloy, cold-drawn	5.40 ^{17,52, 69.71,3}	5.40 ^{4,23,69, 76.73}	5.40 ^{4,73, 74}		5.40 ^{4,33}		5.40 ^{6,25,57}	5.40 ³	5.40 ³					5.80 ⁴ 5.90 ¹¹	
Hi str. low alloy, h.r.	5.55 ^{1,8}		5.55 ^{1,8} 6.05 ⁶	5.55 ^{4,8}			5.55 ¹ 6.05 ⁶	5.55 ³	5.55 ³		5.55 ³				
PLATE Carbon steel	3.70 ^{1,5,18} 4.00 ⁹	3.70 ^{1,23}	3.70 ^{1,6,8}	3.70 ^{4,6}			3.70 ^{1,4,6} 3.95 ¹³		3.70 ³	4.15 ²⁴	3.70 ³	3.70 ³	4.00 ²²		
Floor plates	4.75 ¹	4.75 ¹	4.75 ⁸	4.75 ⁵						4.75 ²⁴					
Alley	4.75 ¹		4.75 ¹				5.20 ^{1,8}			5.05 ¹⁰	4.75 ³	4.75 ³			
Hi str. low alloy	5.65 ^{1,8}	5.65 ¹	5.65 ^{1,8} 5.15 ⁶	5.65 ^{4,5}			5.65 ⁴ 5.70 ^{1,8} 6.15 ⁶			5.90 ²⁴	5.65 ³	5.65 ³			
SHAPES, Structural	3.65 ^{1,5} 3.90 ⁹	3.65 ^{1,23}	3.65 ^{1,8}						3.70 ³	3.70 ⁸		3.70 ³			
Hi str. low alloy	5.50 ^{1,6}	5.50 ¹	5.50 ^{1,8} 6.00 ⁶				6.00 ⁶	5.50 ³	5.50 ⁸		5.50 ³				
MANUFACTURERS' WIRE Bright	4.85 ^{2,5} 5.10 ¹⁸	4.85 ² 4.33.34		4.85 ²			4.85 ⁸	Kokomo = 4.95 ¹⁰ 4.85 ⁸		4.85 ³	4.95 ²	Duluth = 4.85 ²			
PILING, Steel Sheet	4.45 ¹	4.45 ¹	4.45 ⁸						4.45 ³						

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

Key to Steel Producers

1 U. S. Steel Co., Pittsburgh
 2 American Steel & Wire Co., Cleveland
 3 Bethlehem Steel Co., Bethlehem
 4 Republic Steel Corp., Cleveland
 5 Jones & Laughlin Steel Corp., Pittsburgh
 6 Youngstown Sheet & Tube Co., Youngstown
 7 Armcro Steel Corp., Middletown, Ohio
 8 Inland Steel Co., Chicago
 9 Weirton Steel Co., Weirton, W. Va.
 10 National Tube Co., Pittsburgh
 11 Tennessee Coal, Iron & R. R. Co., Birmingham
 12 Great Lakes Steel Corp., Detroit
 13 Sharon Steel Corp., Sharon, Pa.
 14 Colorado Fuel & Iron Corp., Denver
 15 Wheeling Steel Corp., Wheeling, W. Va.
 16 Geneva Steel Co., Salt Lake City
 17 Crucible Steel Co. of America, New York
 18 Pittsburgh Steel Co., Pittsburgh
 19 Kaiser Steel Corp., Oakland, Calif.
 20 Portsmouth Div., Detroit Steel Corp., Detroit
 21 Lukens Steel Co., Coatesville, Pa.
 22 Granite City Steel Co., Granite City, Ill.
 23 Wisconsin Steel Co., South Chicago, Ill.
 24 Columbia Steel Co., San Francisco
 25 Copperweld Steel Co., Glassport, Pa.
 26 Alan Wood Steel Co., Conshohocken, Pa.
 27 Calstrip Steel Corp., Los Angeles
 28 Allegheny Ludlum Steel Corp., Pittsburgh
 29 Claymont Steel Corp., Claymont, Del.
 30 Continental Steel Corp., Kokomo, Ind.
 31 Rotary Electric Steel Co., Detroit
 32 Laclede Steel Co., Alton, Ill.
 33 Northwestern Steel & Wire Co., Sterling, Ill.
 34 Keystone Steel & Wire Co., Peoria, Ill.
 35 Central Iron & Steel Co., Harrisburg, Pa.
 36 Carpenter Steel Co., Reading, Pa.
 37 Eastern Stainless Steel Corp., Baltimore
 38 Washington Steel Corp., Washington, Pa.
 39 JESSOP Steel Co., Washington, Pa.
 40 Blair Strip Steel Co., New Castle, Pa.
 41 Superior Steel Corp., Carnegie, Pa.
 42 Timken Steel & Tube Div., Canton, Ohio
 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
 44 Reeves Steel & Mfg. Co., Dover, Ohio
 45 John A. Roebling's Sons Co., Trenton, N. J.
 46 Simonds Saw & Steel Co., Fitchburg, Mass.
 47 McLouth Steel Corp., Detroit
 48 Cold Metal Products Co., Youngstown
 49 Thomas Steel Co., Warren, Ohio
 50 Wilson Steel & Wire Co., Chicago
 51 Sweet's Steel Co., Williamsport, Pa.
 52 Superior Drawn Steel Co., Monaca, Pa.
 53 Tremont Nail Co., Wareham, Mass.
 54 Firth Sterling St. & Carbide, McKeesport
 55 Ingersoll Steel Div., Chicago
 56 Phoenix Iron & Steel Co., Phoenixville, Pa.
 57 Fitzsimons Steel Co., Youngstown
 58 Stanley Works, New Britain, Conn.
 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
 60 American Cladmetals Co., Carnegie, Pa.
 61 Cuyahoga Steel & Wire Co., Cleveland
 62 Bethlehem Pacific Coast Steel, San Fran.
 63 Follansbee Steel Corp., Pittsburgh
 64 Niles Rolling Mill Co., Niles, Ohio
 65 Atlantic Steel Co., Atlanta
 66 Acme Steel Co., Chicago
 67 Joslyn Mfg. & Supply Co., Chicago
 68 Detroit Steel Corp., Detroit
 69 Wycoff Steel Co., Pittsburgh
 70 Bliss & Laughlin, Inc., Harvey, Ill.
 71 Columbia Steel & Shaving Co., Pittsburgh
 72 Cumberland Steel Co., Cumberland, Md.
 73 La Salle Steel Co., Chicago
 74 Monarch Steel Co., Inc., Hammond, Ind.
 75 Empire Steel Co., Mansfield, Ohio
 76 Mahoning Valley Steel Co., Niles, Ohio
 77 Oliver Iron & Steel Co., Pittsburgh
 78 Pittsburgh Screw & Bolt Co., Pittsburgh
 79 Standard Forging Corp., Chicago
 80 Driver Harris Co., Harrison, N. J.
 81 Detroit Tube & Steel Div., Detroit
 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
 83 Sheffield Steel Corp., Kansas City
 84 Plymouth Steel Co., Detroit
 85 Wickwire Spencer Steel, Buffalo
 86 Angell Nail and Chaplet, Cleveland
 87 Mid-States Steel & Wire, Crawfordsville, Ind.
 88 National Supply, Pittsburgh, Pa.
 89 Wheatland Tube Co., Wheatland, Pa.
 90 Mercer Tube & Mfg. Co., Sharon, Pa.
 91 Woodward Iron Co., Woodward, Ala.
 92 Sloss-Steel & Iron Co., Birmingham
 93 Hanna Furnace Corp., Detroit
 94 Interlake Iron Corp., Cleveland
 95 Lone Star Steel Co., Dallas
 96 Mystic Iron Works, Everett, Mass.
 97 Jackson Iron & Steel Co., Jackson, O.
 98 Globe Iron Co., Jackson, O.
 99 Pittsburgh Coke & Chemical Co., Pittsburgh
 100 Shenango Furnace Co., Pittsburgh
 101 Tennessee Products & Chem. Corp., Nashville
 102 Koppers Co., Inc., Granite City, Ill.
 103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
 104 Wallingford Steel Co., Wallingford, Conn.
 105 Tonawanda Iron Div., N. Tonawanda, N. Y.
 106 Pilgrim Drawn Steel Div., Automotive Materials Corp., Plymouth, Mich.

[†] Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 lb 128-lb, deduct \$2.20 from 1.25-lb coke base box.

Steel Prices

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	18.50	20.00	18.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structural	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	38.50	37.00	39.00
Strip hot-rolled	28.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	50.00	45.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢); 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13 (type 301 add 4¢); Butler, Pa., 7; Wallingford, Conn., 104.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Structural: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

Plates: Brackenridge, Pa., 28 (type 316 add 4¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

*ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 Series.

WASHINGTON STEEL—Slightly lower on 300 Series except where noted.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails									
	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.
Alab. City-4	118	126	123	136	5.70	5.95				
Alquippa, Pa.-5	118	132	136	140	5.70	6.15				
Atlanta-65	121	133	126	143	5.95	6.40				
Bartontown-34	118	130	123	143	5.70	6.15				
Buffalo-85	125					4.85				
Cleveland-86						5.70	6.15			
Cleveland-2						5.70	6.15			
Crawfordville-87						5.70	6.15			
Donora, Pa.-2	118	130	123	140	5.70	6.15				
Duluth-2	118	130	123	140	5.70	6.15				
Fairfield, A.R.-11	118	130	123	140	5.70	6.15				
Houston-83	126	138				5.70	6.15			
Johnstown, Pa.-3	118	130		140		5.70	6.15			
Joliet, Ill.-2	118	130	123	140	5.70	6.15				
Kokomo, Ind.-30	120	132	125	138	5.80	6.05				
Los Angeles-82						6.65				
Kansas City-3	130		135			5.70	6.15			
Minnequa-14	123	138	130	146	5.95	6.45				
Monessen-18	124	135				5.95	6.40			
Moline, Ill.-4						5.70	6.15			
Pittsburg						5.70	6.15			
Cal-24	137		147	156	6.65	6.80				
Portsmouth-20	124	137		147	6.10	6.60				
Rankin, Pa.-2	118	130		140	5.70	6.15				
So. Chicago, Ill.-4	118	126	140	123	5.70	5.95				
S. San Fran.-14				147	6.65	7.10				
Sparrows Pt.-3	120		125	142	5.80	6.25				
Sterling, Ill.-33	118	130	123	140	5.70	6.15				
Struthers, Ohio-6						5.70	6.15			
Torrance, Cal.-24	138					6.65				
Worcester-2	124					6.00	6.45			
Williamsport, Pa.-51						150				

Cut Nails, carloads, base, \$7.35 per 100 lb (less 2¢ to jobbers), at Conshohocken, Pa., (26), Wheeling, W. Va., (15), \$7.15.

(1) Alabama City and So. Chicago do not include zinc extra.

RAILS, TRACK SUPPLIES

F.o.b. Mill	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Ang.	Screw Spikes	Tie Plates	Track Sets	Track Treated
Bessemer-1	3.60	4.00	4.70						
Chicago-4									
Cleveland-3									
Ensley-11	3.60	4.00							
Fairfield-11		4.00	4.70	6.50	5.00				
Gary-1	3.60	4.00							
Ind. Harbor-8	3.60	4.00	4.70	6.15	5.00				
Johnstown-3									
Joliet-1		4.00	4.70						
Kansas City-83									
Lackawanna-3	3.60	4.00	4.70						
Lebanon-4									
Minnequa-14	3.60	4.50	4.70	6.15					
Pittsburgh-3									
Pittsburgh-77									
Pittsburgh-78									
Pittsburgh-8									
Pittsburgh-24									
Seattle-62									
Steelton-3	3.60	4.00	4.70						
Struthers-6									
Torrance-24									
Youngstown-4									
Cleveland-4									

BOILER TUBES \$ per 100 ft., cut, 10 to 24 in.

F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD- In.	B.W. Ga.	H.R. C.D.	H.R. C.D.	H.R. C.D.	H.R. C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.36
	2½	12	30.48	35.84	29.57	34.71
	3	12	33.90	39.30	32.88	36.70
	3½	11	42.37	49.88	41.10	48.31
	4	10	52.60	61.88	51.02	60.02
National Tube	2	13	21.82	26.48		
	2½	12	30.49	35.32		
	3	12	34.00	41.64		
	3½	11	40.34	49.41		
	4	10	51.21	62.72		
Pittsburgh Steel	2	13			27.00	
	2½	12			30.49	37.15
	3	12			34.95	42.90
	3½	11			41.48	50.54
	4	10			52.65	64.18

FLUORSPAR

Washed gravel, f.o.b. Rosiclair, Ill. Price, net ton; Effective CaF₂ content: 70% or more..... \$40.00 60% or less..... 40.00

STANDARD T. & C.	BUTTWELD								SEAMLESS							
	1/2 in.	3/4 in.	1 in.	1 1/4 in.	1 1/2 in.	2 in.	2 1/2-3 in.	2 in.	2 1/2-3 in.	3 1/4 in.	4 in.	5 in.	6 in.	7 in.	8 in.	
Sparrows Pt.-3	34.0	12.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	21.0	41.0	22.5	41.5	23.0	22.0	
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	24.5	43.5	24.0	24.0	
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	13.0	
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.5	43.0	22.5	43.5	22.5	22.5	
Pittsburgh-10	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.5	43.0	22.5	43.5	22.5	22.5	
Alton, Ill.-32	35.0	13.0	38.0	17.0	40.5	20.0	41.0	21.0	41.5	22.0	42.0	22.5	43.0	23.0	23.0	
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	21.0	42.5	22.0	43.0	23.0	43.5	23.0	23.0	
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5											

Miscellaneous Prices

WAREHOUSES

CITIES	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars							
	Hot-Rolled	Cold-Rolled	(15 gauge)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled	As rolled	Hot-Rolled	As rolled	Cold-Drawn	As rolled	Cold-Drawn	As rolled
Baltimore	5.80	6.04	7.49 ²	6.04	.....	5.80	6.14	6.04	6.84- 6.99	10.24	10.54	11.89	12.19	.....	.....	.....	.....
Birmingham*	5.80	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston	6.30	7.00	7.74	6.15	8.50 ⁴	6.48	6.20	6.05	6.79	10.25	10.55	11.90	12.20	.....	.....	.....	.....
Buffalo	5.80	6.40	7.74	5.80	.....	6.05	5.80	5.80	6.40	10.15	10.45	11.80	11.95	.....	.....	.....	.....
Chicago	5.80	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75	.....	.....	.....	.....
Cincinnati*	5.87	6.44	7.39	5.80	.....	6.19	6.09	5.80	6.81	10.15	10.45	11.80	12.10	.....	.....	.....	.....
Cleveland	5.80	6.40	8.10	5.80	8.80 ⁴	6.02	5.82	5.57	6.40	9.91	10.21	11.56	11.86	.....	.....	.....	.....
Detroit	5.78	6.53	7.89	5.94	.....	5.98	6.09	5.84	6.58	10.71	10.41	11.78	12.06	.....	.....	.....	.....
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.05	6.38	10.35	11.25	.....	12.75	.....	.....	.....	.....
Indianapolis, Ind.	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35	.....	.....	.....	.....
Los Angeles	6.35	7.90	8.85	6.40	9.48 ⁴	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50	.....	.....	.....	.....
Memphis*	6.33	7.08	.....	6.33	.....	6.43	6.33	6.08	7.18	.....	.....	.....	.....	.....	.....	.....	.....
6.38	7.18	6.38	6.38	6.38	6.38	6.02	6.48	6.33	7.32	.....	.....	.....	.....	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.69	.....	5.94	5.84	5.69	6.44	9.94	10.24	11.59	11.89	.....	.....	.....	.....
New Orleans*	5.70	6.50	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....	.....	.....	.....	.....
New York*	5.87	7.10 ¹	8.14 ²	6.29	8.63 ⁴	6.28	6.10	6.12	6.98	10.05	10.35	11.70	12.10	.....	.....	.....	.....
5.87	7.24 ¹	6.98	6.98	6.58	6.58	6.50 ³	6.80 ³	6.55 ³	.....	10.15	10.45	11.80	12.20	.....	.....	.....	.....
Norfolk	6.50 ³	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia*	5.80	6.00	8.00	6.10	.....	6.05	5.90	6.05	6.88	9.90	10.20	.....	.....	.....	.....	.....	.....
Pittsburgh	5.80	6.40	7.75	6.65	.....	5.75	5.70	5.55	6.15	6.80	10.10	11.45	11.75	.....	.....	.....	.....
Portland	5.80	8.05	8.80	7.30	.....	6.00	6.95	6.90	.....	.....	12.15	.....	.....	.....	.....	.....	.....
Salt Lake City	7.35	.....	9.70	8.70	.....	8.05	8.75	7.95	9.00	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco*	6.88	8.05 ²	8.56	6.00	9.05 ⁴	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.50	.....	.....	.....	.....
Seattle	7.05	8.00	9.20	9.05	.....	6.75	6.65	6.75	6.05	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis	5.80	6.65	8.00	5.80	8.00 ⁴	6.13	6.03	5.80	6.58	10.05	10.35	11.70	12.00	.....	.....	.....	.....
5.85	6.20	6.20	6.20	6.20	6.20	6.38	6.26	6.11	6.96	10.38	10.66	12.01	12.31	.....	.....	.....	.....
St. Paul*	6.16	6.96	8.31	6.11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bare: 2000 lb or over. Alloy bars: 1000 to 1000 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 8000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Baltimore-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-01	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-02	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	63.75	.....
Buffalo-83	52.00	52.50	53.00	.....	.....	.....	.....
Chicago-04	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-4	52.00	52.50	52.50	53.00	.....	.....	.....
Dalingerfield, Tex.-95	48.00	48.50	48.50	53.00	.....	.....	.....
Desert-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-04	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-90	57.00	57.50	57.50	58.00	.....	.....	.....
Fentana-19	58.00	58.50	58.50	59.00	.....	.....	.....
Genoa, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.40	55.00	.....	.....	.....
Hobart, Ohio-6	52.00	52.50	52.50	53.00	.....	.....	.....
Ironon, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Jackson, Ohio-97, 98	52.00	52.50	52.50	53.00	62.50	66.00	.....
Lyle, Tenn.-101	54.00	54.50	55.00	55.50	.....	.....	.....
Monessen-18	52.00	52.50	53.00	53.50	.....	.....	.....
Neville Island-90	52.00	52.50	53.00	53.50	.....	.....	.....
Pittsburgh-1	52.00	52.50	53.00	53.50	.....	.....	.....
Starkeville-100	52.00	52.50	52.50	53.00	60.00	.....	.....
Steeltown-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedenland-59	56.00	56.50	57.00	57.50	60.00	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	60.00	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	55.50	60.00	.....	.....
Youngstown-6	52.00	52.50	52.50	53.00	60.00	.....	.....
N. Tonawanda, N. Y.-105	52.00	52.50	53.00	53.50	60.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phosph. 1.75 to 2.00 pct, 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct silicon, 50¢ per ton for each 0.50 pct phosphorus, content 0.70 pct and over. Silvery Iron: Add \$1.50 per ton for each 0.50 pct silicon over base (0.91 to 0.95 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer overall on prices are \$1 over comparable silvery iron.

REFRACTORIES

(F.o.b. works)	Carloads, Per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5).....	\$94.60
No. 1 Ohio.....	88.00
Sec. quality, Pa., Md., Ky., Ill., Mo.	88.00
No. 2 Ohio.....	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50).....	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$94.60
Childs, Pa.	39.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick

Per Net Ton	
Standard chemically bonded, Balt., Chester	\$82.00

Magnesite Brick

Standard, Baltimore	\$104.00
Chemically bonded, Baltimore	93.00

St. % in. grains
Domestic, f.o.b. Baltimore, in bulk fines removed
Domestic, f.o.b. Chewelah, Wash., in bulk
Domestic, f.o.b. in sacks
10¢; Missouri Valley, add 20¢
\$13.75

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)	Connellsville, Pa.
Foundry, oven coke	\$17.50 to \$18.00
Buffalo, del'd	\$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	25.00
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedenland, Pa., f.o.b.	22.60
Paterson, N. J., f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

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Miscellaneous Prices

BOLTS, NUTS, RIVETS, SCREWS Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham, or Chicago)

Machine and Carriage Bolts

	Pot Off List	Less	Case C.
1/4 in. & smaller x 6 in. & shorter	15	11 1/2	
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	13 1/2	
5/8 in. & larger x 6 in. & shorter	17 1/2	12 1/2	
All diam. longer than 6 in.	14	27 1/2	
Lag, all diam. x 6 in. & shorter	23	16	
Lag, all diam. longer than 6 in.	21	23	
Plow bolts	84		

Nuts, Hot Pressed, Cold Punched—Sq.

	Pot Off List	Less	Less	Less
	Keg	K.	Keg	K.
1/4 in. & smaller	15	28 1/2	15	21 1/2
9/16 in. & 5/8 in.	12	25	6 1/2	21
5/8 in. to 1 1/2 in.				
Inclusive	9	23	1	10 1/2
1 1/2 in. & larger	7 1/2	23	1	10 1/2

Nuts, Hot Pressed—Hexagon

	Pot Off List	Less	Less	Less
	Keg	K.	Keg	K.
1/4 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	31
5/8 in. to 1 1/2 in.				
Inclusive	12	25	2	17 1/2
1 1/2 in. & larger	8 1/2	23	2	17 1/2

Nuts, Cold Punched—Hexagon

	Pot Off List	Less	Less	Less
	Keg	K.	Keg	K.
1/4 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
5/8 in. to 1 1/2 in.				
Inclusive	19 1/2	31 1/2	12	25
1 1/2 in. & larger	12	25	6 1/2	21

Nuts, Semi-Finished—Hexagon

	Pot Off List	Reg.	Hvy.
1/4 in. & smaller	35	45	28 1/2
9/16 in. & 5/8 in.	29 1/2	40 1/2	32
5/8 in. to 1 1/2 in.			
Inclusive	24	36	15
1 1/2 in. & larger	13	26	8 1/2
		Light	
7/16 in. & Smaller	35	45	
1/2 in. thru 5/8 in.	28 1/2	39 1/2	
5/8 in. to 1 1/2 in.			
Inclusive	26	37	

Stove Bolts

	Pot Off List
Packaged, steel, plain finished	48-10
Packaged, plated finish	31-10

Bulk, plain finish**

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5,000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

	Base per 100 lb.	Pot Off List
1/2 in. & larger	37.75

	Pot Off List
7/16 in. & Smaller	.....
F.O.B. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	26

Cap and Set Screws

	Pot Off List
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright	44

1/4 in. thru 1 in. up to & including 6 in.	44
high C double heat treat	44

5/8 in. thru 1 in. up to & including 6 in.	41
Milled studs	41

Flat head cap screws, listed sizes	16
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter	11

Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter	11
Less ton lots	11

S. M. Ferrochrome	11
Contract price, cents per pound, chrome contained, lump size, delivered	11

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C	11
Less ton lots	11

Low carbon type: 62-66% Cr, 4-8% Si, 4-6% Mn, 1.25% max. C	11
Carloads	11

Ton lots	10.66
Less ton lots	10.66



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KAPRODE
*TRADE MARK

ELECTRODES

AVAILABLE: The New Kaprode Electrode with Kaprode Shank Adapter. This small cap type electrode inserts into semi-permanent shank, forming an assembly to fit any standard Morse taper holder of corresponding taper size.

TESTED: WW-Kaprode thoroughly tested on a number of production operations in motor car plants. Engineers report it a technical success with cost savings of 20% and better.

COPPER SAVINGS: WW-Kaprode was developed to conserve the nation's copper supply and serve the needs of resistance welding users. Copper savings can run as high as 75%.

COST SAVINGS: Over-all electrode cost savings in ordinary shop operations will run 20% or more. Careful operators can effect savings as high as 50%.

INVENTORY SAVINGS: Only a small supply of shanks is needed. All Kaprode electrodes are interchangeable, and one shank can outlast ten or more tips.

TIME SAVINGS: WW-Kaprode Electrodes are quickly replaced without removing the shank from the holder. For complete information on Kaprode Electrodes, Adapter Shanks and Extractors, ask for Bulletin 14-100. Weiger-Weed & Company, Division of Fansteel Metallurgical Corporation, 11644 Cloverdale Ave., Detroit 4, Mich.



Miscellaneous Prices

ELECTRODES

Cents per lb., f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in. in.	Length in in.	Cents Per lb.
GRAPHITE		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2 1/2	24, 30	23.15
2	24, 30	25.36
CARBON		
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b., mill
Stainless-carbon Plate Sheet

No. 304, 20 pct.

Coatesville, Pa. (21) \$29.5

Washgtn, Pa. (39) \$29.5

Claymont, Del. (29) \$28.00

Conshohocken, Pa. (26) \$27.50

New Castle, Ind. (55) \$26.50

Nickel-carbon \$25.50

10 pct Coatesville (31) 32.5

Inconel-carbon 40.5

Monel-carbon 33.5

No. 302 Stainless-copper stainless, Carnegie, Pa. (60) 77.00

Aluminized steel sheets, hot dip, Butler, Pa. (7) 7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	5	\$1.505
18	4	2	—	—	\$2.13
1.5	4	1.5	8	—	\$81.0
6	4	2	6	—	96.54

High carbon chromium 63.5¢

Oil hardened manganese 35¢

Special carbon 32.5¢

Extra carbon 27¢

Regular carbon 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.

New York, ocean bags 7.4¢ to 9.0¢

Canadian sponge iron, del'd,

In East 10.00¢

Domestic sponge iron, 98+%

Fe, carload lots 15.5¢ to 17.0¢

Electrolytic iron, annealed,

99.5+% Fe 42.5¢

Electrolytic iron, unannealed,

minus 325 mesh, 99+% Fe 53.5¢

Hydrogen reduced iron, mi-

nus 300 mesh, 98+% Fe 63.0¢ to 80.0¢

Carbonyl iron, size 5 to 10

micron, 98% 98.8+% Fe 83.0¢ to \$1.48

Aluminum 31.5¢

Brass, 10 ton lots 30.0¢ to 33.25¢

Copper, electrolytic 10.75¢ plus metal value

Copper, reduced 10.00¢ plus metal value

Cadmium, 100-199 lb. 95¢ plus metal value

Chromium, electrolytic, 99%

min., and quantity, del'd \$3.50

Lead 7.5¢ to 12.0¢ plus metal value

Manganese 57.0¢

Molybdenum, 99% \$2.75

Nickel, unannealed 88.0¢

Nickel, annealed 95.0¢

Nickel, spherical, unannealed 92.0¢

Silicon 38.5¢

Solder powder 7.0¢ to 9.0¢ plus met value

Stainless steel, 302 83.00¢

Stainless steel, 316 \$1.10

Tin 14.00¢ plus metal value

Tungsten, 99% (65 mesh) \$6.00

Zinc, 10 ton lots 23.0¢ to 30.5¢



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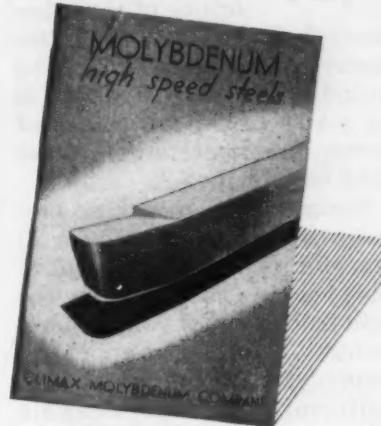
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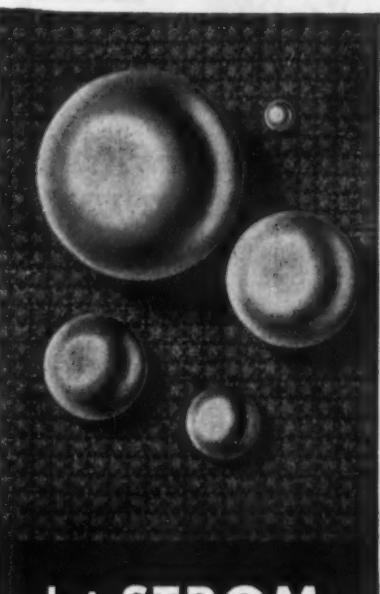
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Miscellaneous Prices

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Amature	Elec.	Motor	Dynamic	Trans. 72	Trans. 85	Trans.
Beech-Bottom-15	7.25	8.50	9.30	9.85	10.40	11.10	
Brackenridge-28	7.25	8.50	9.30	9.85			
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	7.95	9.20					
Ind. Harbor-3	6.75	7.25					
Mansfield-75	7.25	7.75	9.00	9.80			
Miles, O.-64	7.05	7.55					
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)
0.06% C ... 30.50 0.20% C ... 29.50
0.10% C ... 30.00 0.50% C ... 29.25
0.15% C ... 29.75 1.00% C ... 29.00
2.00% C ... 28.75
65-69% Cr, 4-9% C ... 32.00
62-66% Cr, 4-6% C, 6-9% Si ... 22.60

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 2.5¢ per lb.
High carbon 8 mesh and down.
62 to 66% Cr, 5 to 7% C, 7 to 10% Si.
Carloads, bulk ... 33.25
Carloads, packed ... 34.15
Ton lots, packed ... 37.25

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.
0.10% max. C ... \$1.14
0.50% max. C ... 1.10
9 to 11% C ... 1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.
30-33% Ca, 60-65% Si, 3.00% max. Fe.
Carloads ... 19.00
Ton lots ... 22.10
Less ton lots ... 23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads ... 20.00
Ton lots ... 22.30
Less ton lots ... 23.80

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.
Ton lots ... 16.50¢
Less ton lots ... 17.75¢

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%. Ca 5 to 7%.
Carload packed ... 18.00¢
Ton lots to carload packed ... 19.00¢
Less ton lots ... 20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.
Ton lots ... 17.50
Less ton lots ... 19.50

POROUS CASTINGS

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Nonferrous castings that are porous and are to be used for liquids can be economically sealed against leaks with N® Silicate. Aluminum or magnesium castings are immersed about 4 hours in N Silicate diluted to 30° Be., heated to 150-200°F. Castings are then washed in hot water and dried at 215-300°F. Properly applied N Silicate impregnation avoids loss of serviceable castings.

For more information on the uses of silicates of soda in your plant, call PQ.

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Ferroalloy Prices

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.	
F.o.b. Niagara Falls, Alloy, W. Va.,	
Ashtabula, O.	\$185
F.o.b. Johnstown, Pa.	\$187
F.o.b. Sheridan, Pa.	\$188
F.o.b. Etna, Clairton, Pa.	\$188
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78% Mn, cents per pound of briquet.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerston, Pa. \$74.00	\$75.00
Fgh. or Chicago 75.00	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn.	19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05
Less ton lots	2.40
	\$2.95
	4.55
	\$8.75

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$32.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$39.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe.	21.70
97% Si, 1% Fe.	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.	
Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.	
25% Si	20.00
50% Si	12.40
90-95% Si	17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd. Mn 85-90%.	
Carloads Ton Less	
0.7% max. C, 0.06% P, 90% Mn	26.25
0.07% max. C	25.75
0.15% max. C	25.25
0.30% max. C	24.75
0.50% max. C	24.25
0.75% max. C, 7.00% max. Si	21.25
	23.10
	24.30

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	9.90¢
Ton lots	11.30¢

Calcium molybdate, 45-49%, f.o.b. Langloch, Pa., per pound contained Mo.	\$1.15
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Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.	
Ton lots	\$4.90
Less ton lots	4.95

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	
10 tons to less carload	\$3.75

Ferromolybdenum, 55-75%, f.o.b. Langloch, Pa., per pound contained Mo.	\$1.82
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Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti.	\$1.35
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Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti.	\$1.50
Less ton lots	1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton.	\$177.00
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Ferrotungsten, standard, lump or 1/4 x down, packed, per pound contained W, 5 ton lots, delivered.	\$5.00
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Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primos)	3.20-3.25

Molybdc oxide, briquets or cans, per lb contained Mo, f.o.b. Langloch, Pa., bags, f.o.b. Washington, Pa., Langloch, Pa.	\$1.14
	\$1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium pentoxide, 36-39% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅	\$1.28
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Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢

Zirconium, 12-15% contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00¢

Boron Agents

Contract prices per lb of alloy, del. Bortam, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.	
Ton lots, per pound	45¢

Less ton lots, per pound	50¢
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Carbortam, Ti, 15-21% B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
10 to 14% B ....	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	\$1.00
No. 6	68¢
No. 79	50¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.	
Ton lots	\$1.46
Less ton lots	1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80

Sileaz, contract basis, delivered.	
Ton lots	45.00¢

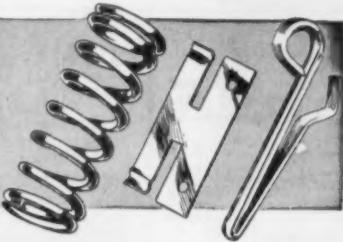
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WHAT

WHEN

WHERE

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C O N V E Y E R S

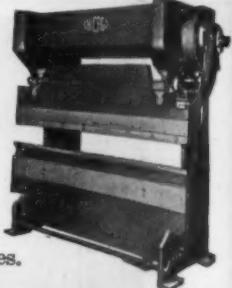
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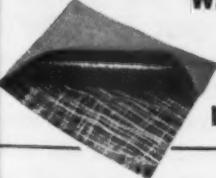
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1480 cu. ft. Worthington 23" x 14 x 16". With 300 H.P. Syn Motor 4160/3/60

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40 Ton Shaw-Bar Trolley, Equipped with 15 H.P. G.E. Motor. Gauge of Trolley 7'6", Lift 80'. New 1942

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¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment and numerous dies
No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10" or 12" dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump

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2" AJAX Upsetting and Forging Machine—New 1941. Equipped with Air Clutch

FURNACE—MELTING

400 lb. Moore Type "UT" Melting Furnace Top Charge, Complete with Transformer. New 1943—Little Used

15 ton Heraut Model V-12 Electric Melting Furnace, Top Charge hydraulically operated, Complete with Transformer Equipment

GRINDER

No. 72 Hanchett Vertical Surface Grinder Three Spindle 72" Rotary Table with Electrical Equipment

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Gisholt Model 2L Turret Lathe, Motor Driven 15" Dia. 3 Jaw Universal Chuck, 4" Hole in Spindle. NEW 1942 or Later.

MOTOR

750 H.P. G.E. Synchronous Motor 2300/3/40 450 RPM Slightly Used

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48 x 48" x 12' Niles-Bement-Pond, Four Head 60 x 60" x 12' Niles-Bement-Pond, Four Head 120 x 72" x 19' Betts, Four Head

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10,000# Olesen Universal Wire Testing Machine 20,000# Southwark S10C Universal Hydr. Testing Machine 120,000 lb SOUTHWARK-TATE-EMERY Universal Hydraulic Testing Machine. LATE 300,000 lb SOUTHWARK-EMERY Universal Hydraulic Testing Machine

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Order Is Out!—At long last the used machine tool field was put under the shelter of OPS price controls. The new Ceiling Price Reg. 80 is basically a reprint of the old OPA World War II order and does not include the current price administration's proposed new gimmick of pricing by weight.

Beginning Oct. 13, all used machine tools, including rebuilt and reconditioned, and used extra parts must be sold under the new regulation. Special invoicing requirements apply to all sales. A certificate of guarantee must be submitted with sales.

January Prices—CPR 80 sets ceilings generally on the basis of manufacturers' new list prices, as of Jan. 25, 1951. Prices are subject to specified markdown percentages, depending on age and condition of equipment.

Any used item without a serial number will be considered as having been built before Jan. 1, 1916, unless definite proof of a more recent age is established.

Pricing Facts—Percentages of net prices which will apply to rebuilt and guaranteed, reconditioned, and "as is" machine tools and extras, in that sequence, are:

Built after Jan. 1, 1948—95 pct, 85, and 75.

Built after Jan. 1, 1936—90 pct, 75, and 60.

Built after Jan. 1, 1928—85 pct, 70, and 50.

Built after Jan. 1, 1922—70 pct, 50, and 30.

Built after Jan. 1, 1916—60 pct, 40, and 20.

Built before Jan. 1, 1916—50 pct, 30, and 15.

Tide Turns?—The defense effort is beginning to make itself felt in the Pittsburgh district market. So much so that very little business is done by mail these days. Speed is the by-word and the man who needs a machine knows that the telephone is his best friend.

Dealers and brokers here think nothing of receiving and making calls to such far-off places as California and Texas. The build-up of the aircraft industry on the West Coast is evident by the number of calls received from there. A broker here tells of selling two machines last week, later getting two additional orders for the same pieces of equipment.

Production Tools—Bulk of the machine tool deals in Pittsburgh are for production machines, milling machines, turret lathes, chucking machines, screw machines, and the like—indicating that defense plants now have their orders, are working frantically to get equipment to fill them.

Still there are too many inquiries that can't be taken care of.

Mill Machinery—The steel mill equipment field in Pittsburgh is just as busy if not more so. A leading dealer just back from a convention spent more money on telephone calls than for his hotel accommodations. People he had never heard of, both in this country and abroad, looked him up to see what kind of deal could be made for equipment.

Rebuilders' Assn.—Now that clean-cut rules of rebuilding used machine tools have been set in CPR 80, formation of National Machinery Rebuilders Assn. becomes doubly significant. The CPR 80 clause specifying rigorous rebuilding specifications could be the beginning or permanent standards for rebuilt machines.

Smaller dealers who are not able to fulfill specifications of OPS for rebuilding cannot participate in this "higher percentage" business unless they reequip their shops.

J. M. P. Fox, formerly head of MDNA is now executive vice president of the new association.

DIGEST

of the week in metalworking

FREE WORLD PRAISES U. S. INDUSTRY

Technical men from overseas seeing the sights at the World Metallurgical Congress told *The Iron Age* that they marveled at American productivity and cooperation of U.S. industries in trading tech knowledge. The visitors swapped quite a bit of it themselves and talked of industry abroad.

NEW CHROME CARBIDE SERIES MAKES DEBUT

Carboley Dept. of GE has put on the market a series 600 chrome carbides. This was disclosed at the Detroit Metal Exposition. The new series 600 have a nickel binder but contain no tungsten or cobalt. They are made from powdered metals and offer excellent resistance to abrasion, corrosion.

APPLIANCE SHORTAGE IS HEADING THIS WAY

Dealer inventories of home appliances are comfortable now but coming heavier civilian cutbacks will bring a shortage next year. It will start in the first quarter 1952 and come to a head later. NPA last week announced first quarter allocations of steel will range from 50 to 60 pct of base.

TRADE GROUPS MOBILIZE FOR WAR WORK

The small businessman who has been searching for war subcontracts and has been meeting failure while deeper civilian CMP cutbacks are shaping up has an ally in the trade association. This is the small manufacturer's organized defense against being snubbed when defense work comes faster.

HOLD LINE ON RIGHT TO PASS COST RISES

The inclusion of cost increases in computing industry's selling prices is now assured. Despite calamity howls of terrible inflation Congress has turned thumbs down on killing the so-called Capehart amendment. Government power philosophers have come up with yet another shortage—Texas.

SHORTAGES SHARPEN FOCUS ON ALUMINUM

Recent progress in aluminum processing techniques and threats of long-term copper shortage have put sharper focus on aluminum as an engineering material for automotive production. A new brazing development has made possible an all-aluminum engine. Casting methods advance further.

AIR FORCE EMPTIES RESERVE TOOL SITES

What's left of the 30,000 machine tools in two Air Force depots must be cleaned out next week—or perhaps be scrapped. Machine tool builders and rebuilders got first crack at the 5000 tools in reserve. Contractors will examine the remainder. The Navy has kept its reserves intact.

ASSEMBLY INSPECTION WITH 22-MEV X-RAYS

The 22-million volt betatron, little brother of big atom smashers, produces X-rays which can look through thick steel and inspect assembled mechanisms. Besides the ability to inspect thicker sections, the 22-mev X-rays have other advantages over those produced by filament machines.

FOREIGN METALLURGISTS SPARK METAL SHOW

With more exhibitors and the most intensive technical program to date, the 33rd National Metal Congress was host to the first world metallurgical meeting last week in Detroit. Lectures, awards, banquets plus long-haired dissertations and practical discussions drew over 40,000 visitors.

WHO OWNS THE RIGHTS TO THAT INVENTION?

The employer has a right to an employee's invention only by previous agreement. When developed and perfected on employer's time and with his materials and facilities, invention may be subject to a "shop right"—which is not an exclusive right. A person employed to invent has no rights.

CONTROLS CAUSING STEEL MARKET SHIFTS

Controls are not only causing the pattern of steel product mix to change, but they are also causing some products to become easier, others tighter. Sheets used to be the tightest item; now they're one of the easiest. Some conversion sheets are going begging. Bars, plates, structurals tight.

MORE TITANIUM OXIDE IS BEING PRODUCED

The Quebec Iron and Titanium Corp. has shipped 340,000 gross tons of ilmenite from the Allard Lake mine this year. The ore contains about 35 pct TiO_2 and 40 pct of iron. It is the only large field of a hematite-bearing ilmenite ore known. Proved reserves are over 120 million gross tons.

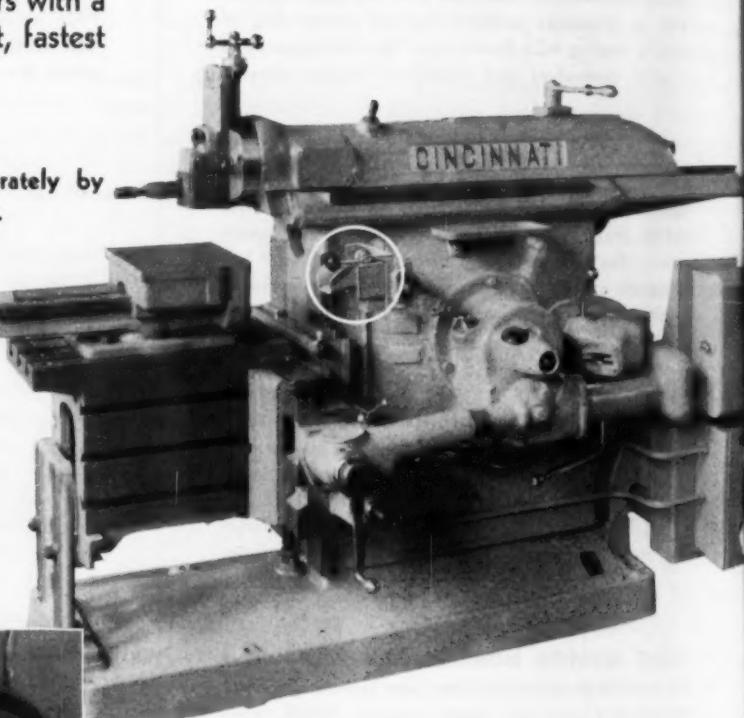
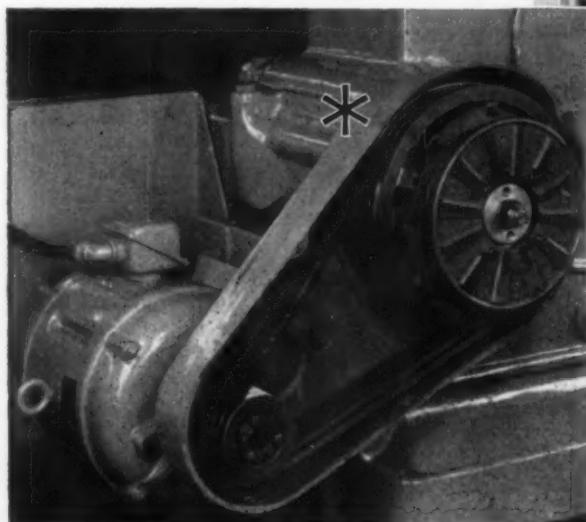
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